

EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 2, 22, 24 and 27
&
Industry Canada (IC), RSS-GEN, 132, 133 and 139



A division of Research In Motion Limited

REPORT NO.: RTS-6036-1303-30B

PRODUCT MODEL NO.:	RFS121LW, RFR101LW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARFS120LW, L6ARFR100LW
IC:	2503A-RFS120LW, 2503A-RFR100LW
EMISSION DESIGNATOR (GSM):	246KGXW
EMISSION DESIGNATOR (EDGE):	245KG7W
EMISSION DESIGNATOR (WCDMA):	4M17F9W
EMISSION DESIGNATOR (LTE QPSK):	See Appendix for details
EMISSION DESIGNATOR (LTE 16QAM):	See Appendix for details

DATE: June 03, 2013

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



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Test Report No.:
RTS-6036-1303-30B**Dates of Test:**
February 26 to May 30, 2013**FCC ID:** L6ARFS120LW
FCC ID: L6ARFR100LW**IC:** 2503A-RFS120LW
IC: 2503A-RFR100LW**Statement of Performance:**

The BlackBerry® smartphone, model RFS121LW, part number CER-54731-001 Rev3-x09-01 and accessories perform within the requirements of the test standards when configured and operated per RIM's instructions.

The BlackBerry® smartphone, model RFR101LW, part number CER-54730-001- Rev 2-x09-03 (909) and accessories perform within the requirements of the test standards when configured and operated per RIM's instructions.

Declaration:

We hereby certify that:

The test data reported herein is an accurate record of the performance of the sample(s) tested.

The test results are valid for the tested unit (s) only.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

The test methods were consistent with the methods described in the relevant standards.

Documented by:Reviewed by:

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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.
- FCC CFR 47 Part 27, Subpart C, Technical Standards, Oct, 2012.
- Industry Canada, RSS-132 Issue 3, January 2013, Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz.
- Industry Canada, RSS-133 Issue 6, January 2013, 2 GHz Personal Communications Services.
- Industry Canada, RSS-GEN Issue 3, December 2010, General Requirements and Information for the Certification of Radio communication Equipment.
- Industry Canada, RSS-139 Issue 2, February 2009, Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz.

B. Associated Documents

1. RFR101LW_HW_Declaration_CER-54730-001- Rev 2-x09-03 (909)
2. MultiSourceDeclaration_RFS121LW_10.1.0.1411_1412
3. MultiSourceDeclaration_RFR101LW_10.1.0.1665_1666.
4. BlackBerrySystemSimilarity_RFS121LW_RFR101LW

C. Product Identification

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

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

RIM Testing Services EMI test facilities

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

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

The testing was performed from February 26 to May 30, 2013.

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BlackBerry® smartphone Samples Tested

Sample	Model	CER NUMBER	PIN	Software Information
1	RFS121LW	CER-54731-001 Rev1-906-00	2AB02A48	OS: 127.0.1.4081
2	RFS121LW	CER-54731-001 Rev1-906-00	2AB02A65	OS: 127.0.1.4081
3	RFS121LW	CER-54731-001 Rev1-906-00	2AB02A5A	OS: 127.0.1.4081
4	RFS121LW	CER-54731-001 Rev2-906-01	2AB04CFB	OS: 127.0.1.4081
5	RFS121LW	CER-54731-001 Rev2-906-01	2AB02A58	OS: 127.0.1.4081
6	RFS121LW	CER-54731-001 Rev3-x09-01	2FFF9AA1	OS: 10.1.0.1411
7	RFS121LW	CER-54731-001 Rev1-906-00	2AB02AD8	OS: 127.0.1.4081
8	RFR101LW	CER-54730-001- Rev 2-x09-03 (909)	2FFFB6F9	OS: 10.1.0.1666
9	RFR101LW	CER-54730-001- Rev 2-x09-03 (909)	2FFFB6AD	OS: 10.1.0.1666
10	RFR101LW	CER-54730-001- Rev 2-x09-03 (909)	2FFFB6AC	OS: 10.1.0.1666

RF Conducted Emissions testing was performed on samples 7 and 8.

RF Radiated Emission testing was performed on sample 1, 2, 3, 4, 5, 6, 9 and 10.

Only the characteristics that may have been affected by the changes from RFS121LW Rev1-906-00 to RFS121LW Rev3-x09-01 were re-tested.

For more details, refer to RFS121LW_HW_Declaration_CER-54731-001_Rev3-x09-01.

Only the characteristics that may have been affected by the changes from RFS121LW to RFR101LW were re-tested.

For more information, see BlackBerrySystemSimilarity_RFS121LW_RFR101LW.

To view the differences between OS: 127.0.1.4081 and OS: 10.1.0.1666 see document MultiSourceDeclaration_RFR101LW_10.1.0.1665_1666.

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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.

A. Test Results Chart

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 24.238	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5	GSM850 / PCS1900 Conducted Spurious Emissions	Pass	1A
Part 2.1049 Part 22.917 Part 24.238	RSS-GEN, 4.6	GSM 850 / PCS1900 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.1055 Part 24.235	RSS-132, 5.3 RSS-133, 6.3	GSM 850 / PCS1900 Frequency Stability vs. Temperature and Voltage	Pass	1B
Part 22.913(a)(2) Part 24.232(c)	RSS-132, 5.4 RSS-133, 6.4	GSM850 ERP PCS1900 EIRP	Pass	1C
Part 2.1053 Part 22.917 Part 24.238	RSS-GEN, 4.9 RSS-132, 4.5 RSS-133, 6.5	GSM850 / PCS1900 Radiated Spurious/Harmonic Emissions	Pass	1C
Part 2.1051 Part 22.917 Part 24.238 Part 27.53(h)	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5 RSS-139, 6.5	WCDMA Band 2/5/4 Conducted Spurious Emissions	Pass	2A
Part 2.1049 Part 22.917 Part 24.238 Part 27.53(h)(1)	RSS-GEN, 4.6	WCDMA Band 2/5/4 Occupied Bandwidth and Channel Mask	Pass	2A
Part 24.232 (d) Part 27.50 (d)(5)	RSS-133, 6.4 RSS-139, 6.4	WCDMA Band 2/4 Peak to Average Ratio measurements	Pass	2A
Part 2.1055(a)(d) Part 24.235 Part 27.54	RSS-132, 5.3 RSS-133, 6.3 RSS-139, 6.3	WCDMA Band 2/5/4 Frequency Stability vs. Temperature and Voltage	Pass	2B
Part 22.913(a)(2) Part 24.232(c) Part 27.50(d)(4)	RSS-132, 5.4 RSS-133, 6.4 RSS-139, 6.4	WCDMA Band 5 ERP WCDMA Band 2/4 EIRP	Pass	2C
Part 2.1053 Part 22.917 Part 24.238 Part 27.53(h)	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5 RSS-139, 6.5	WCDMA Band 2/5 Radiated Spurious/Harmonic Emissions	Pass	2C

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Part 2.1051 Part 24.238(a) Part 24.50 (d)	RSS-133, 6.5	LTE Band 2 Conducted Spurious Emissions	Pass	3A
Part 2.1049 Part 24.238	RSS-GEN, 4.6	LTE Band 2 Occupied Bandwidth and Channel Mask	Pass	3A
Part 24.232 (d)	RSS-133, 6.4	LTE Band 2 Peak to Average Ratio measurements	Pass	3A
Part 2.1055(a)(d) Part 24.235	RSS-133, 6.3	LTE Band 2 Frequency Stability vs. Temperature and Voltage	Pass	3B
Part 24.232(b)(c)	RSS-133, 6.4	LTE Band 2 EIRP	Pass	3C
Part 24.238	RSS-133, 6.5	LTE Band 2 Radiated Spurious/Harmonic Emissions	Pass	3C
Part 2.1051 Part 22.917	RSS-132, 5.5	LTE Band 5 Conducted Spurious Emissions	Pass	4A
Part 2.1049 Part 22.917	RSS-GEN, 4.6	LTE Band 5 Occupied Bandwidth and Channel Mask	Pass	4A
Part 2.1055(a)(d)	RSS-132, 5.3	LTE Band 5 Frequency Stability vs. Temperature and Voltage	Pass	4B
Part 22.913(a)(2)	RSS-132, 5.4	LTE Band 5 ERP	Pass	4C
Part 22.917	RSS-132, 5.5	LTE Band 5 Radiated Spurious/Harmonic Emissions	Pass	4C
Part 2.1051 Part 27.53(h)	RSS-139, 6.5	LTE Band 4 Conducted Spurious Emissions	Pass	5A
Part 2.1049 Part 27.53(h)(1)	RSS-GEN, 4.6	LTE Band 4 Occupied Bandwidth and Channel Mask	Pass	5A
Part 27.50 (d)(5)	RSS-139, 6.4	LTE Band 4 Peak to Average Ratio measurements	Pass	5A
Part 2.1055 Part 27.54	RSS-139, 6.3	LTE Band 4 Frequency Stability vs. Temperature and Voltage	Pass	5B
Part 2.1053 Part 27.50(d)(4)	RSS-139, 6.4	LTE Band 4 EIRP	Pass	5C
Part 2.1053 Part 27.53(h)	RSS-139, 6.5	LTE Band 4 Radiated Spurious/Harmonic Emissions	Pass	5C
Part 2.1051 Part 27.53(g)	-	LTE Band 17 Conducted Spurious Emissions	Pass	6A

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Part 2.1049 Part 27.53(g)	-	LTE Band 17 Occupied Bandwidth and Channel Mask	Pass	6A
Part 27.50 (d)(5)	-	LTE Band 17 Peak to Average Ratio measurements	Pass	6A
Part 2.1055 Part 27.54	-	LTE Band 17 Frequency Stability vs. Temperature and Voltage	Pass	6B
Part 2.1053 Part 27.50(c)(9)	-	LTE Band 17 ERP	Pass	6C
Part 2.1053 Part 27.53(g)	-	LTE Band 17 Radiated Spurious/Harmonic Emissions	Pass	6C

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E. Summary of Results

1) Conducted Emission Measurements

a) GSM 850 and PCS 1900

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

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

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the GSM850 as per 47 CFR 2.1049, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in CALL and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 244.6 kHz on low channel in CALL mode, and 244.6 kHz on low channel in EDGE mode. See APPENDIX 1A for test data.

The EUT met the requirements of the Occupied Bandwidth and channel mask in the PCS1900 as per 47 CFR 2.1049, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in CALL and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 246.0 kHz on mid channel in CALL mode, and 244.6 kHz on low channel in EDGE mode. See APPENDIX 1A for test data.

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

The EUT met the requirements of the Frequency Stability in the PCS1900 as per 47 CFR 2.1055 and RSS-133, 6.3. The EUT was measured in PCS1900 mode on the low, middle and high channels. See APPENDIX 1B for test data.

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b) WCDMA Band 5 / 2 / 4

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

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

The EUT met the requirements of the Tx Conducted Spurious Emissions in the WCDMA Band 4 as per 47 CFR 2.1051, CFR 27.53 and RSS-139, 6.5. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 20 GHz. See APPENDIX 2A for test data

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band 5 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in Voice and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.150 MHz on the high channel in Voice mode, and 4.155 MHz on mid and high channels in HSUPA mode. See APPENDIX 2A for test data.

The EUT met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band 2 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in Voice and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.150 MHz on low and mid channels in Voice mode, and 4.165 MHz on the low channel in HSUPA mode. See APPENDIX 2A for test data.

The EUT met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band 4 as per 47 CFR 2.1049, CFR 27.53 and RSS-GEN, 4.6. The EUT was measured in Voice and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.162 MHz on low channel in Voice mode, and 4.153 MHz on the low, mid and high channels in HSUPA mode. See APPENDIX 2A for test data.

- The EUT met the requirements of the Frequency Stability in the WCDMA Band 5 as per 47 CFR 2.1055, and RSS-132, 5.3. The EUT was measured on the low, middle and high channels. See APPENDIX 2B for test data.

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

See APPENDIX 2B for test data.

The EUT met the requirements of the Frequency Stability in the WCDMA Band 4 as per 47 CFR 2.1055, CFR 27.54 and RSS-139, 6.3. The EUT was measured in WCDMA Band 4 mode on the low, middle and high channels.

See APPENDIX 2B for test data.

c) LTE Band 2

- The EUT met the requirements of the Tx Conducted Spurious Emissions in the LTE Band 2 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 2 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. The frequency range investigated was from 30 MHz to 20 GHz.

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the LTE Band 2 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured on the low, middle and high channels.

See Appendix 3A for test data

- The EUT met the requirements of the Tx Peak to Average Ratio in the LTE Band 2 as per 47 CFR 24.232 (5)(d). The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 2 with QPSK and 16-QAM modulations. Different resource block allocations were also investigated, a minimum one resource block case was also tested.

See APPENDIX 3A for test data

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- The EUT met the requirements of the Frequency Stability in the LTE Band 2 as per 47 CFR 2.1055, CFR 24.235 and RSS-133, 6.3. The EUT was measured in LTE Band 2 mode on the low, middle and high channels in 20MHz BW with 100 resource blocks and QPSK modulation.
See APPENDIX 3B for test data.

d) LTE Band 5

- The EUT met the requirements of the Tx Conducted Spurious Emissions in the LTE Band 5 as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d), RSS-132, 5.5 and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz and 10MHz as per scalable bandwidths for LTE Band 5 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. The frequency range investigated was from 30 MHz to 10 GHz.
See APPENDIX 4A for test data.

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the LTE Band 5 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz and 10MHz bandwidths for LTE Band 5 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested.
See APPENDIX 4A for test data.

- The EUT met the requirements of the Frequency Stability in the LTE Band 5 as per 47 CFR 2.1055, CFR 22.917 and RSS-132, 5.3. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz and 10MHz as per scalable bandwidths for LTE Band 5 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested.
See APPENDIX 4B for test data.

e) LTE Band 4

- The EUT met the requirements of the Tx Conducted Spurious Emissions in the LTE Band 4 as per 47 CFR 2.1051, CFR 27.53 and RSS-139, 6.5. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 4 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. The frequency range investigated was from 30 MHz to 20 GHz.

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- The EUT met the requirements of the Occupied Bandwidth and channel mask in the LTE Band 4 as per 47 CFR 2.1049, CFR 27.53 and RSS-GEN, 4.6. The EUT was measured on the low, middle and high channels.

See Appendix 5A for test data

- The EUT met the requirements of the Tx Peak to Average Ratio in the LTE Band 4 as per 47 CFR 27.50 (5)(d) and RSS-139, 6.4. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 4 with QPSK and 16-QAM modulations. Different resource block allocations were also investigated, a minimum one resource block case was also tested.

See APPENDIX 5A for test data

- The EUT met the requirements of the Frequency Stability in the LTE Band 4 as per 47 CFR 2.1055, CFR 27.54 and RSS-139, 6.3. The EUT was measured in LTE Band 4 mode on the low, middle and high channels in 20MHz BW with 100 resource blocks and QPSK modulation.

See APPENDIX 5B for test data.

f) LTE Band 17

- The EUT met the requirements of the Tx Conducted Spurious Emissions in the LTE Band 17 as per 47 CFR 2.1051, CFR 27.53. The EUT was measured on the low, middle and high channels in 5MHz and 10MHz, bandwidths for LTE Band 17 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. The frequency range investigated was from 30 MHz to 20 GHz.

See Appendix 6A for test data

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the LTE Band 17 as per 47 CFR 2.1049, CFR 27.53. The EUT was measured on the low, middle and high channels.

See Appendix 6A for test data

- The EUT met the requirements of the Tx Peak to Average Ratio in the LTE Band 17 as per 47 CFR 27.50 (5)(d). The EUT was measured on the low, middle and high channels in 5MHz and 10MHz bandwidths for LTE Band 17 with QPSK and 16-QAM modulations. Different resource block allocations were also investigated, a minimum one resource block case was also tested.

See APPENDIX 6A for test data

- The EUT met the requirements of the Frequency Stability in the LTE Band 17 as per 47 CFR 2.1055, CFR 27.54. The EUT was measured in LTE Band 17 mode on

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the low, middle and high channels in 20MHz BW with 100 resource blocks and QPSK modulation.

See APPENDIX 6B for test data.

2) Radiated Emission Measurements

The radiated spurious emissions/harmonics and ERP/EIRP were measured. 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.

Measurement result for product RFS121LW:

- The highest ERP in the 850 band Call mode measured was 30.74 dBm (1.19 W) at 824.20 MHz (channel 128)
- The highest ERP in the 850 band EDGE mode measured was 28.71 dBm (0.74 W) at 824.20 MHz (channel 128).
- The highest EIRP in the PCS band Call mode measured was 32.40 dBm (1.74 W) at 1880.00 MHz (channel 661).
- The highest EIRP in the PCS band EDGE mode measured was 31.70 dBm (1.48 W) at 1880.00 MHz (channel 661).

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.

Measurement result for product RFS121LW:

- The worst margin was 22.8dB below the limit at 2466.8MHz in the GSM850 band in EDGE mode.
- All emissions were greater than 25 dB below the accepted limits for all test frequencies in the PCS1900 band.

See Appendix 1C for test data.

Test Report No.:
RTS-6036-1303-30B**Dates of Test:**
February 26 to May 30, 2013**FCC ID:** L6ARFS120LW
FCC ID: L6ARFR100LW**IC:** 2503A-RFS120LW
IC: 2503A-RFR100LW

- b) The radiated spurious emissions/harmonics and ERP/EIRP were measured for WCDMA Band 5 / 2 / 4. The results are within the limits.

Measurement result for product RFS121LW:

- The highest ERP in the WCDMA Band 5, Call Service mode was 24.42 dBm (0.28 W) at 846.60 MHz (channel 4233).
- The highest ERP in the WCDMA Band 5, HSUPA mode was 22.87 dBm (0.19 W) at 846.60 MHz (channel 4233).
- The highest EIRP in the WCDMA Band 2, Call Service mode was 23.97 dBm (0.25 W) at 1852.40 MHz (channel 9262).
- The highest EIRP in the WCDMA Band 2, HSUPA mode was 22.37 dBm (0.17 W) at 1852.40 MHz (channel 9262).

Measurement result for product RFR101LW:

- The highest ERP in the WCDMA Band 4, Call Service mode was 23.16 dBm (0.21 W) at 1732.60 MHz (channel 1413).
- The highest ERP in the WCDMA Band 4, HSUPA mode was 21.54 dBm (0.14 W) at 1732.60 MHz (channel 1413).

The radiated carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the WCDMA Band 5 / 2 / 4. Each band was measured in Call, and HSUPA modes. Both the horizontal and vertical polarizations were measured.

Measurement result for product RFS121LW:

- All emissions were greater than 25 dB below the accepted limits for all test frequencies in WCDMA Band 5.
- All emissions were greater than 25 dB below the accepted limits for all test frequencies in WCDMA Band 2.

Measurement result for product RFR101LW:

- All emissions were greater than 25 dB below the accepted limits for all test frequencies in WCDMA Band 4.

See Appendix 2C for test data.

Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW
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- c) The radiated spurious emissions/harmonics and ERP were measured for LTE Band 2.

The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 2 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The highest EIRP in the LTE Band 2 measured was 23.54 dBm (0.23 W) at 1880 MHz (channel 18900) and 1899.9MHz (channel 19099) in 20MHz BW, 1 resource block and QPSK modulation and
- The highest EIRP in the LTE Band 2 measured was 22.47 dBm (0.18 W) at 1880 MHz (channel 18900) in 20MHz BW, 1 resource block and 16-QAM modulation.

The radiated carrier harmonics were measured up to the 10th harmonic. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 2 with QPSK modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The worst margin was 22.8 dB below the limit at 7404.33MHz.

See Appendix 3C for test data.

- d) The radiated spurious emissions/harmonics and ERP were measured for LTE Band 5.

The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz and 10MHz bandwidths for LTE Band 5 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The highest EIRP in the LTE Band 5 measured was 22.22 dBm (0.17 W) at 834.00 MHz (channel 20500) in 10MHz BW, 1 resource block and QPSK modulation.
- The highest EIRP in the LTE Band 5 measured was 21.42 dBm (0.14 W) at 838.90 MHz (channel 20549) in 10MHz BW, 1 resource block and 16-QAM modulation.

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The radiated carrier harmonics were measured up to the 10th harmonic. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz and 10MHz bandwidths for LTE Band 5 with QPSK modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The worst margin was 22.8dB below the limit at 8360.42MHz.

See Appendix 4C for test data.

- e) The radiated spurious emissions/harmonics and ERP were measured for LTE Band 4.

The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 4 with QPSK and 16-QAM modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The highest EIRP in the LTE Band 4 measured was 23.47 dBm (0.22 W) at 1732.50 MHz (channel 20175) in 20MHz BW, 1 resource block and QPSK modulation.
- The highest EIRP in the LTE Band 4 measured was 22.17 dBm (0.16 W) at 1744.90 MHz (channel 20299) in 20MHz BW, 1 resource block and 16-QAM modulation.

The radiated carrier harmonics were measured up to the 10th harmonic. The EUT was measured on the low, middle and high channels in 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz bandwidths for LTE Band 4 with QPSK modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The worst margin was 8.5dB below the limit at 8555.56MHz.

See Appendix 5C for test data.

- f) The radiated spurious emissions/harmonics and ERP were measured for LTE Band 17.

The EUT was measured on the low, middle and high channels in 5MHz and 10MHz bandwidths for LTE band 17 with QPSK and 16-QAM modulations. Different

Test Report No.:
RTS-6036-1303-30B**Dates of Test:**
February 26 to May 30, 2013**FCC ID:** L6ARFS120LW
FCC ID: L6ARFR100LW**IC:** 2503A-RFS120LW
IC: 2503A-RFR100LW

resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The highest EIRP in the LTE band 17 measured was 19.13 dBm (0.08 W) at 709.0 MHz (channel 23780) in 10MHz BW, 1 resource block and QPSK modulation.
- The highest EIRP in the LTE band 17 measured was 17.99 dBm (0.06 W) at 709.0 MHz (channel 23780) in 10MHz BW, 1 resource block and 16-QAM modulation.

The radiated carrier harmonics were measured up to the 10th harmonic. The EUT was measured on the low, middle and high channels in 5MHz and 10MHz bandwidths for LTE Band 17 with QPSK modulations. Different resource block allocations were investigated, a minimum one resource block case was also tested. Both the horizontal and vertical polarizations were measured.

- The worst margin was 5.5dB below the limit at 1413.06MHz.

See Appendix 6C for test data.

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RTS-6036-1303-30B**Dates of Test:**
February 26 to May 30, 2013**FCC ID:** L6ARFS120LW
FCC ID: L6ARFR100LW**IC:** 2503A-RFS120LW
IC: 2503A-RFR100LW

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:

Measurement performed on RFS121LW:

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

Measurement performed on RFS121LW:

- WCDMA B4 + Bluetooth(DH5) + 802.11b
- LTE Band 2 + Bluetooth(2DH5) + 802.11g
- LTE Band 4 + Bluetooth(3DH5) + 802.11n(2.4GHz)
- LTE Band 5 + Bluetooth(DH5) + 802.11b
- LTE Band 17 + Bluetooth(2DH5) + 802.11g

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

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RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

F. Compliance Test Equipment Used

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
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	13-09-01	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	13-09-01	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	13-08-23	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	13-08-04	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

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RTS-6036-1303-30B

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February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

Compliance Test Equipment Used cont'd

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE (YY MM DD)</u>	<u>USE</u>
Environment Monitor	Omega	iTHX-SD	0380567	13-10-30	Radiated Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	13-10-30	Radiated Emissions
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

G. Test Software used

<u>SOFTWARE</u>	<u>COMPANY</u>	<u>VERSION</u>	<u>USE</u>
EMC32	Rohde & Schwarz	8.52.0	Radiated Emissions
TDK Standard Emission Test	TDK RF Solutions	8.53.1.62	Radiated Emissions

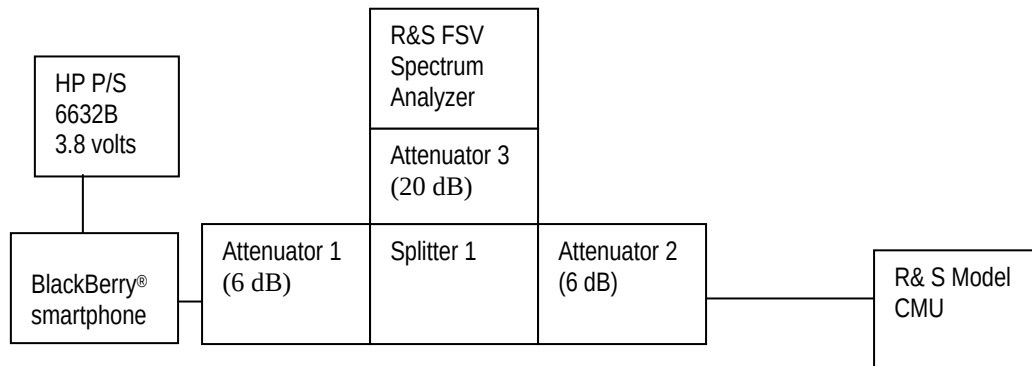
APPENDIX 1A – GSM CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: February 26 - 28, 2013

The environmental conditions were: Temperature: 23.2 - 23.4 °C
 Humidity: 21.6 – 27.2 %

The following measurements were performed by Berkin Can.

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GSM Conducted RF Emission Test Data cont'd

The following measurements were performed on product RFS121LW.

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

See figures 1-1a to 1-12a for the plots of the conducted spurious emissions.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.

The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.

The worst case –26dBc bandwidth for the GSM850 band was measured to be 282 kHz, and for the PCS1900 band was measured to be 274 kHz as shown below. Results were derived in a 3.0 kHz resolution bandwidth.

On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied.

Test Data for GSM850 band and PCS1900 band in Call mode

GSM850 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	276.4	244.6
837.6	272.1	243.1
848.8	272.1	243.1

PCS1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	272.1	243.1
1880.0	277.9	246.0
1909.8	269.2	244.6

Measurement Plots for 850 and 1900 bands in Call mode

See Figures 1-1a to 1-12a for the plots of the conducted spurious emissions.

See Figures 1-13a to 1-24a for the plots of 26dBc/99% Occupied Bandwidth.

See Figures 1-25a to 1-28a for the plots of the Channel mask.

See Figures 1-29a to 1-31a for the plots of Peak to Average Ratio (PCS1900 Band only)

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
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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	244.6
837.6	240.2
848.8	243.1

PCS1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	244.6
1880.0	243.1
1909.8	243.1

Measurement Plots for GSM850 and PCS1900 bands in EDGE mode

See Figures 1-32a to 1-37a for the plots of the 99% Occupied Bandwidth EDGE results.

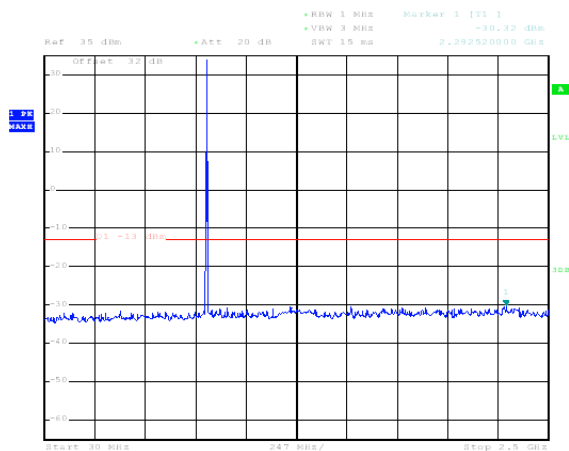
See Figures 1-38a to 1-41a for the plots of channel mask EDGE results.

See Figures 1-42a to 1-53a for the plots of the conducted spurious emissions EDGE results

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

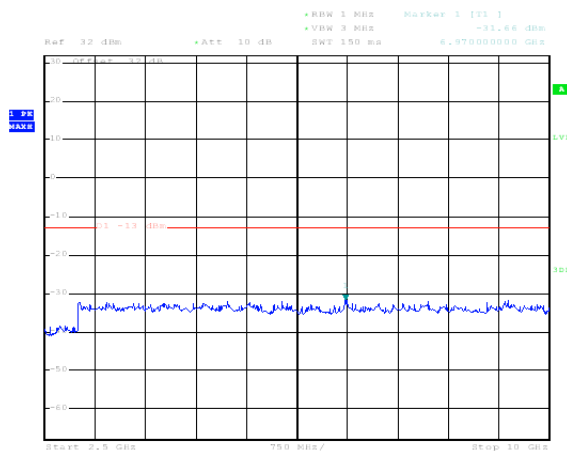
GSM Conducted RF Emission Test Data cont'd

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



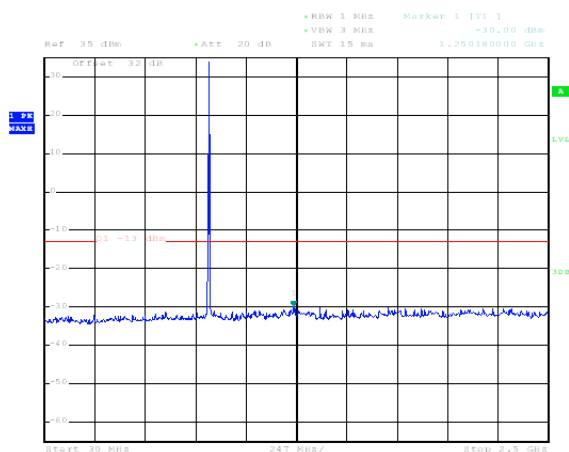
Date: 28.MAR.2013 11:01:27

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



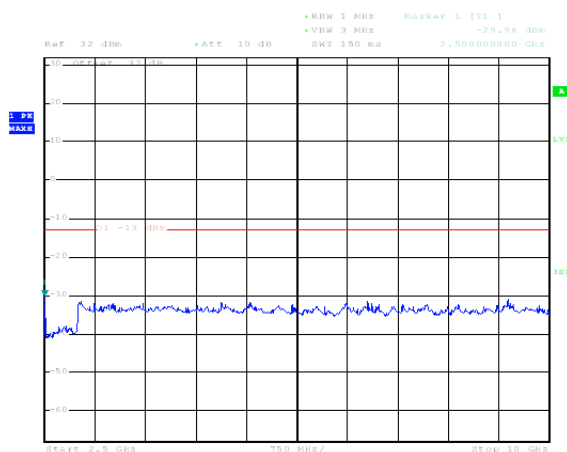
Date: 28.MAR.2013 11:04:50

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



Date: 28.MAR.2013 11:02:11

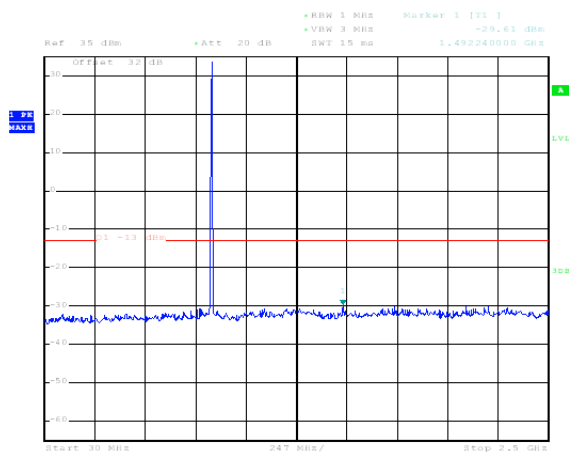
Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



Date: 28.MAR.2013 11:04:21

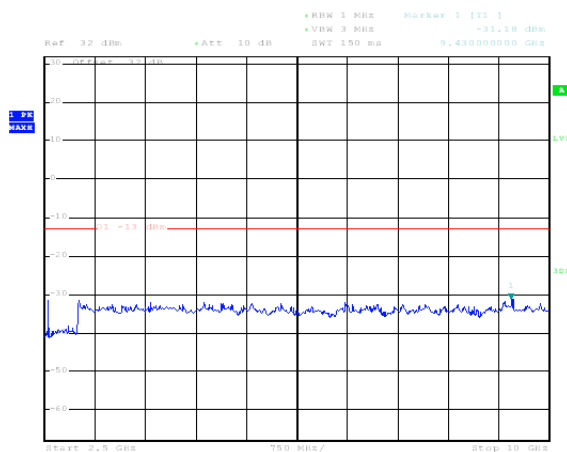
GSM Conducted RF Emission Test Data cont'd

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



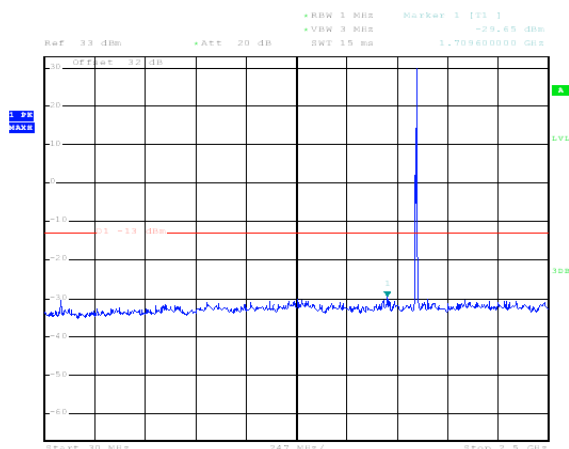
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Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel



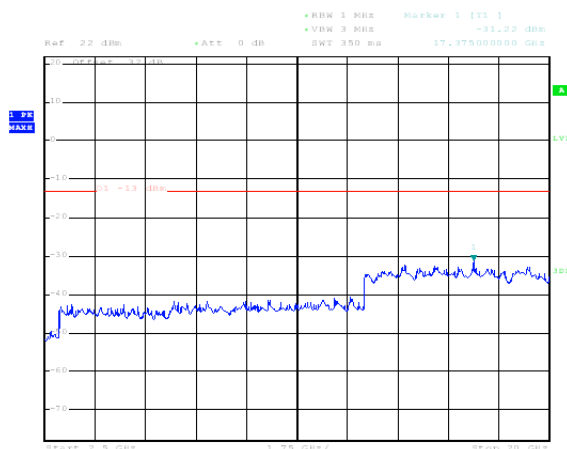
Date: 28.MAR.2013 11:03:46

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



Date: 28.MAR.2013 11:18:12

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

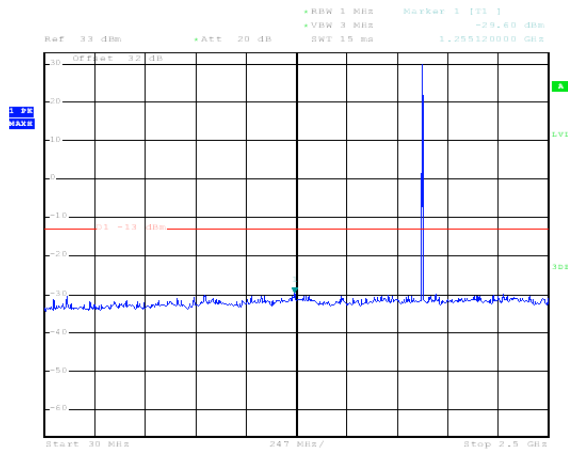


Date: 28.MAR.2013 11:06:04

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

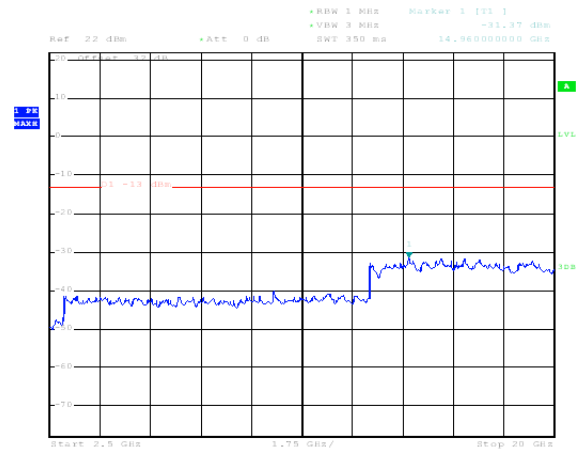
GSM Conducted RF Emission Test Data cont'd

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



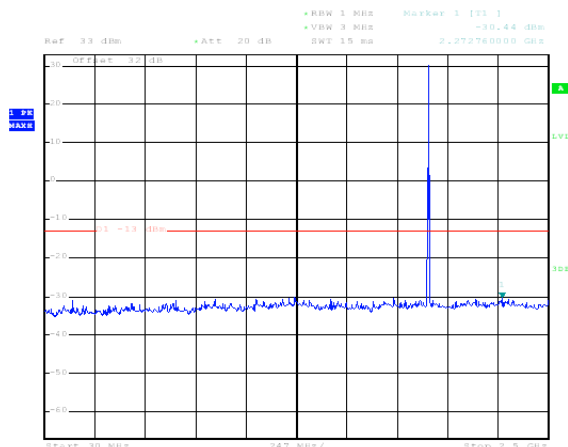
Date: 28.MAR.2013 11:17:49

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



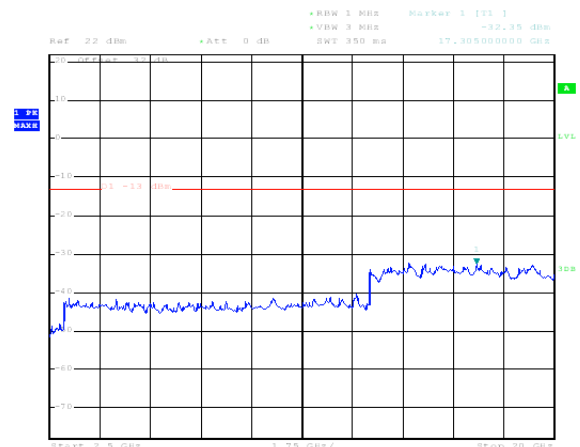
Date: 28.MAR.2013 11:08:35

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



Date: 28.MAR.2013 11:16:56

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



Date: 28.MAR.2013 11:09:10

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
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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: -26dBc bandwidth, GSM850 band
Middle Channel in GSM mode**



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



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



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
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GSM Conducted RF Emission Test Data cont'd

**Figure 1-17a: - Occupied Bandwidth, GSM850 band
Middle Channel in GSM mode**



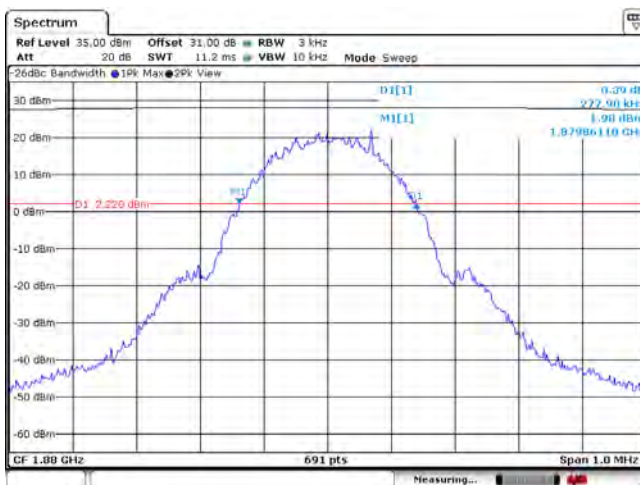
**Figure 1-18a: Occupied Bandwidth, GSM850 band
High Channel in GSM mode**



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



**Figure 1-20a: -26dBc bandwidth, PCS1900
Middle Channel in GSM mode**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

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

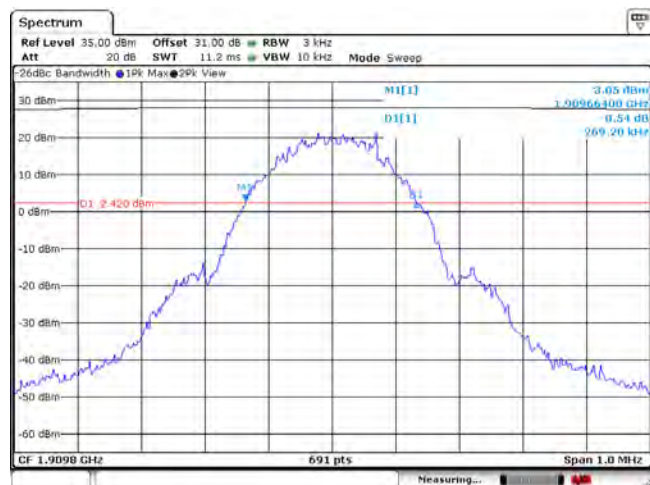


Figure 1-22a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



Figure 1-23a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

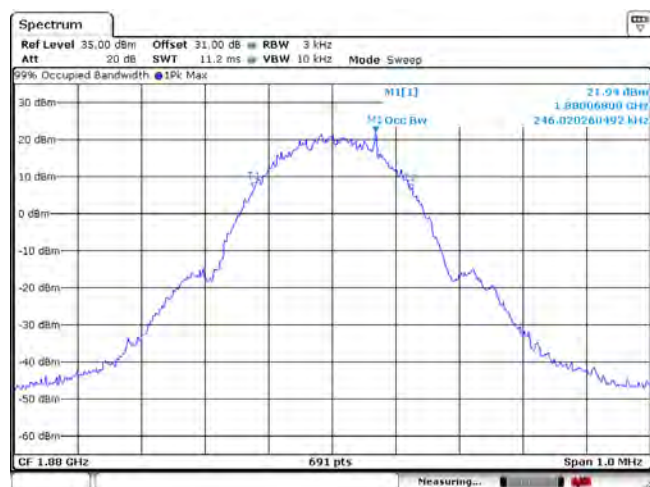
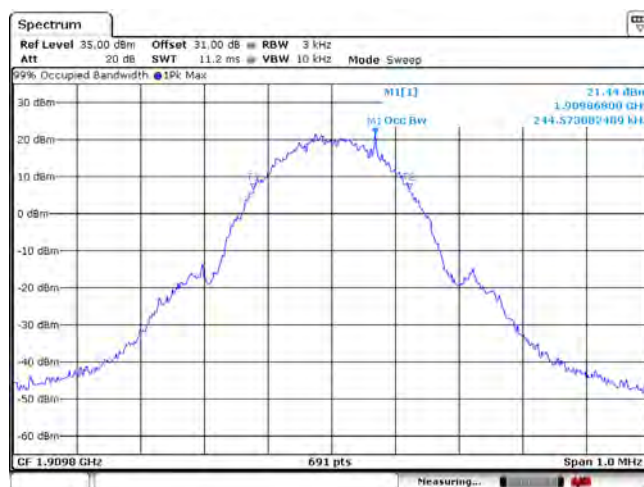


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

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

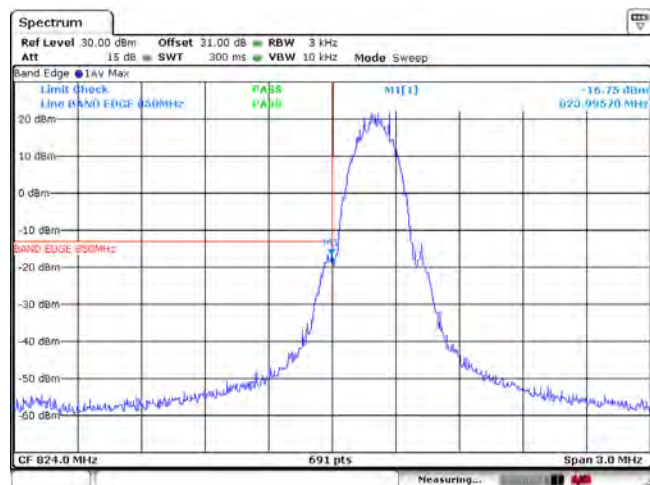


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

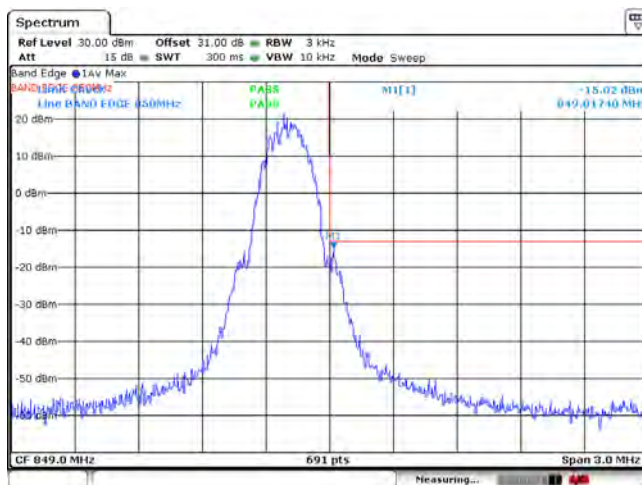


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

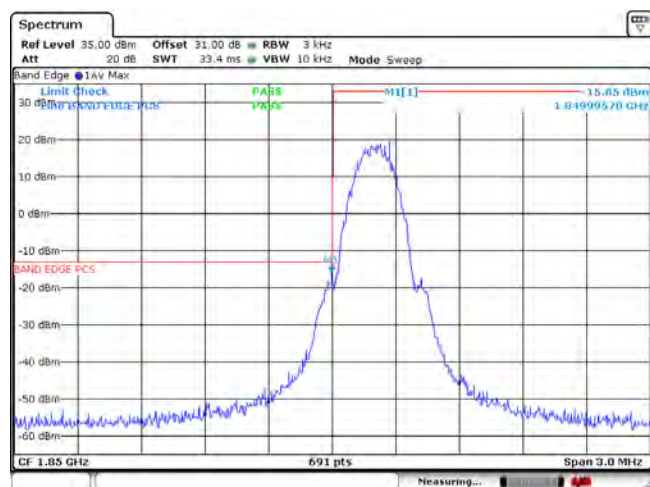
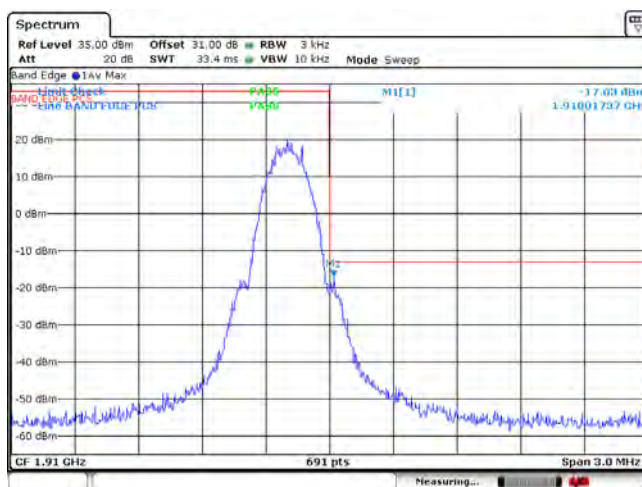


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

Figure 1-29a: PCS1900 Band, PAR Low Channel

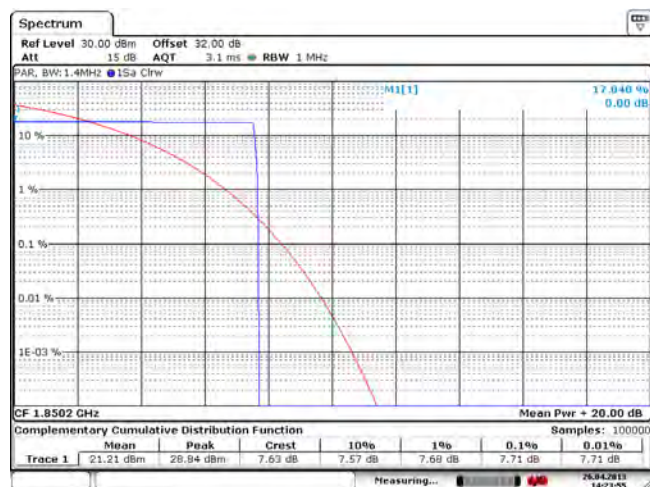


Figure 1-30a: PCS1900 Band, PAR Mid Channel

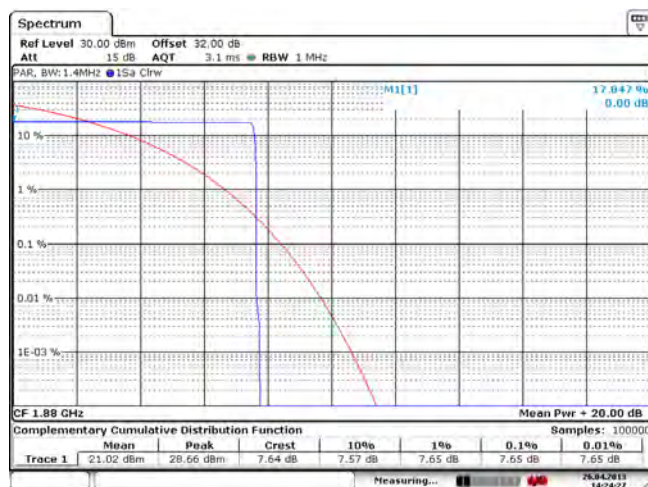
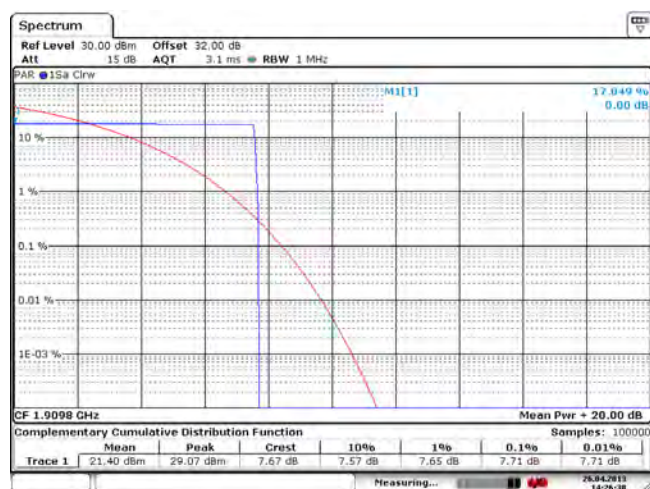


Figure 1-31a: PCS1900 Band, PAR High Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

Figure 1-32a: Occupied Bandwidth, GSM850 Band, Low Channel in EDGE mode

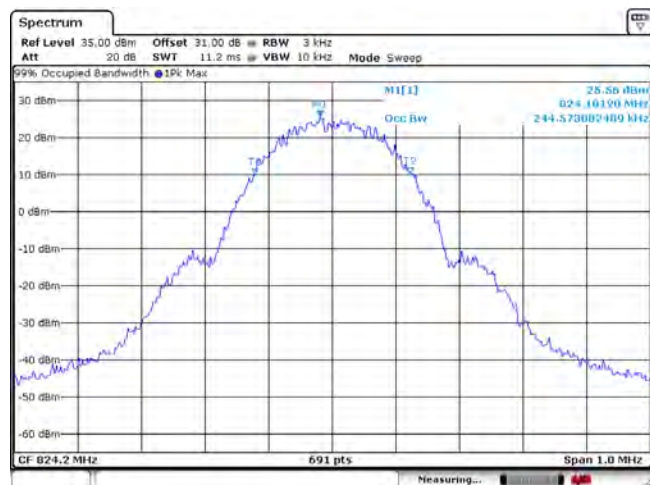


Figure 1-33a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

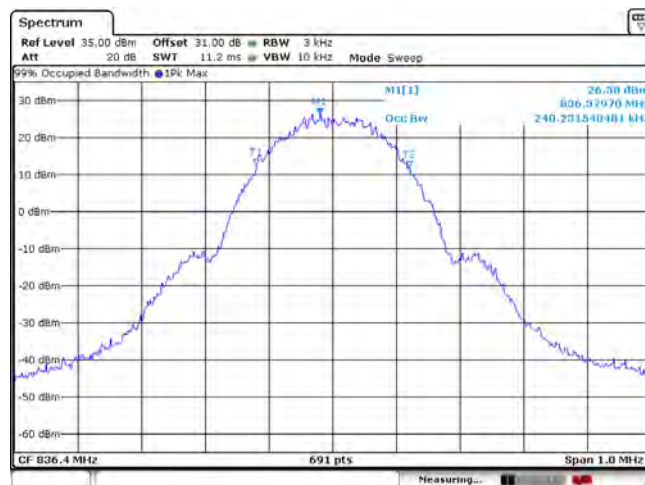


Figure 1-34a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

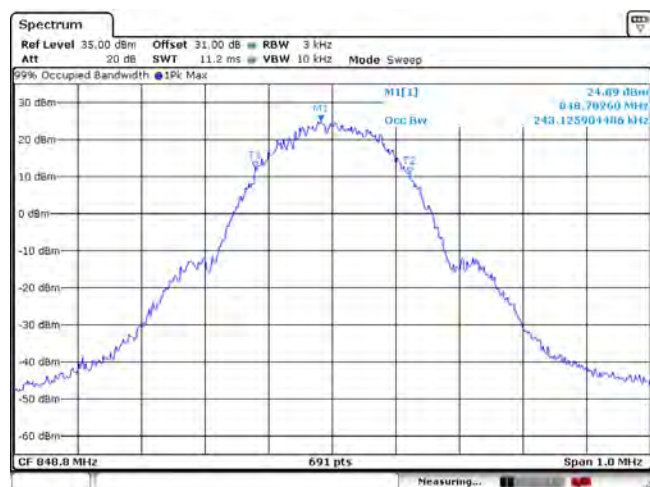
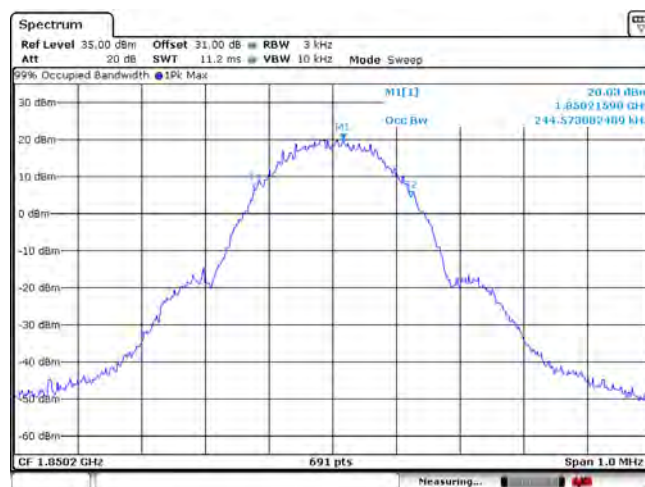


Figure 1-35a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

Figure 1-36a: Occupied Bandwidth, PCS1900 Band, Middle Channel in EDGE mode

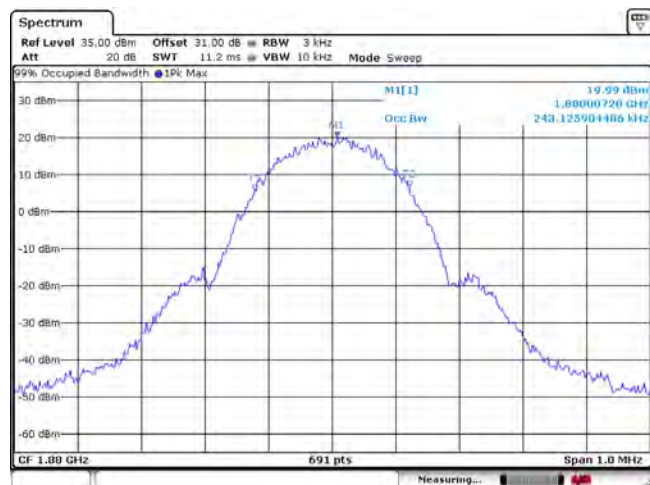


Figure 1-37a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode



Figure 1-38a: GSM850 Band, Low Channel Mask in EDGE mode

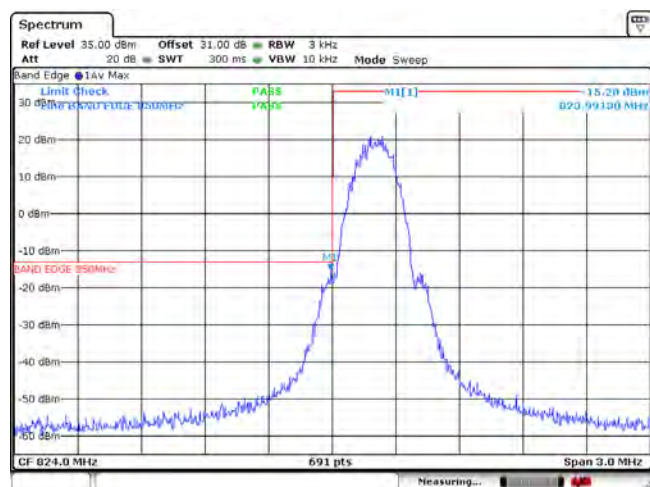
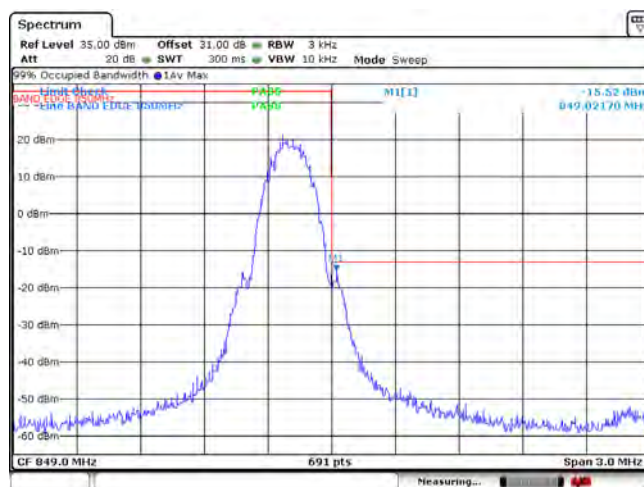


Figure 1-39a: GSM850 Band, High Channel Mask in EDGE mode



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Conducted RF Emission Test Data cont'd

Figure 1-40a: PCS1900 Band, Low Channel Mask in EDGE mode

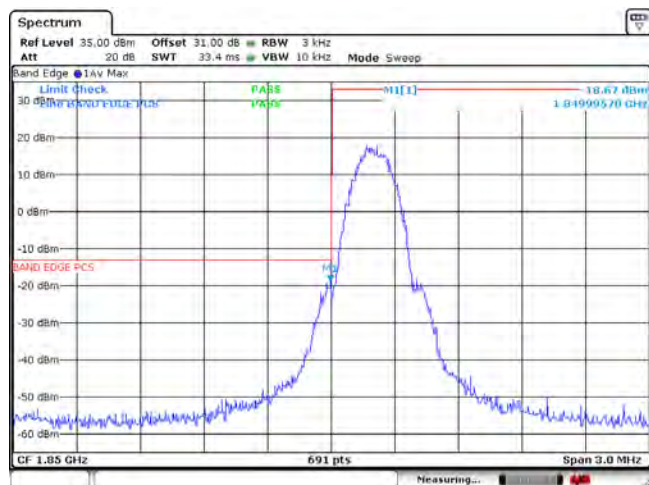
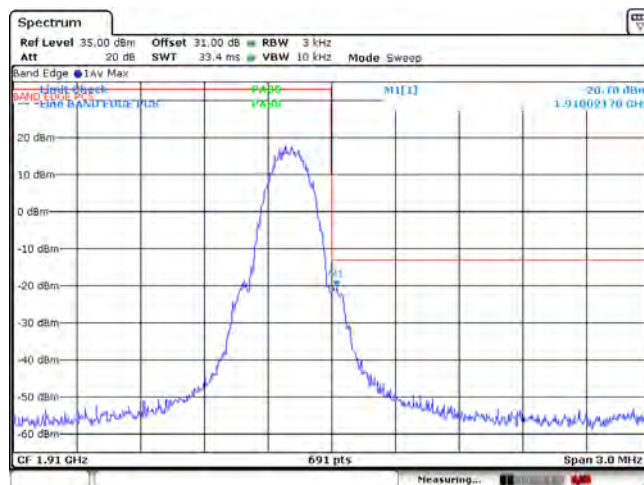


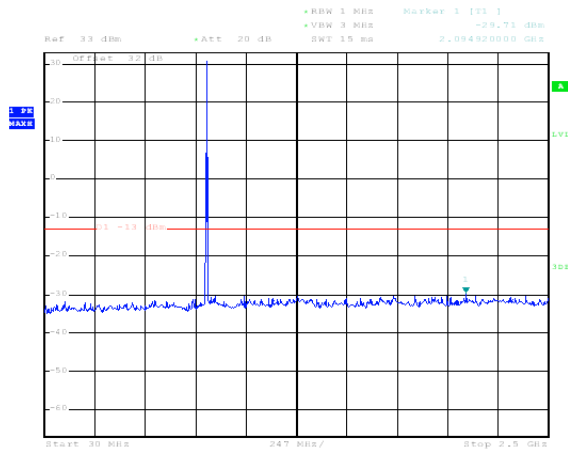
Figure 1-41a: PCS1900 Band, High Channel Mask in EDGE mode



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

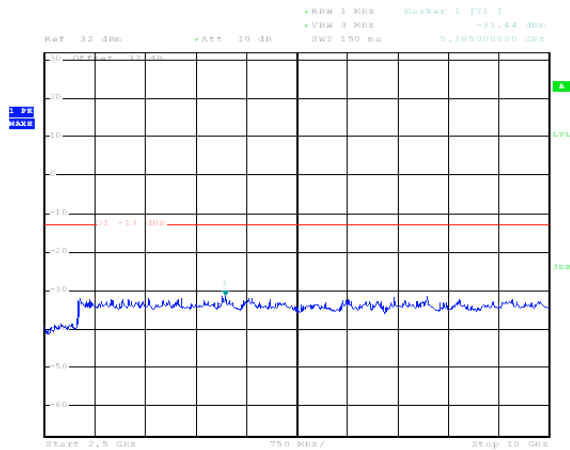
GSM Conducted RF Emission Test Data cont'd

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



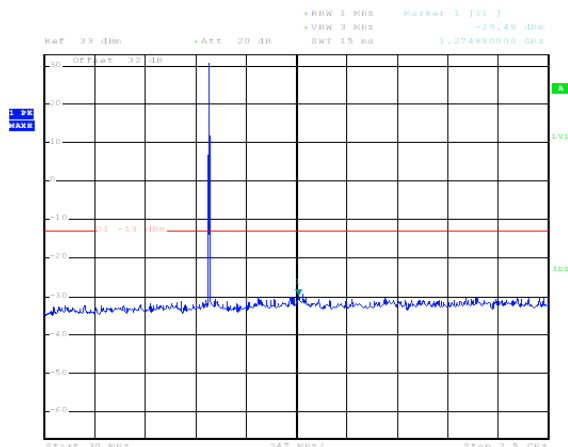
Date: 28.MAR.2013 11:20:37

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



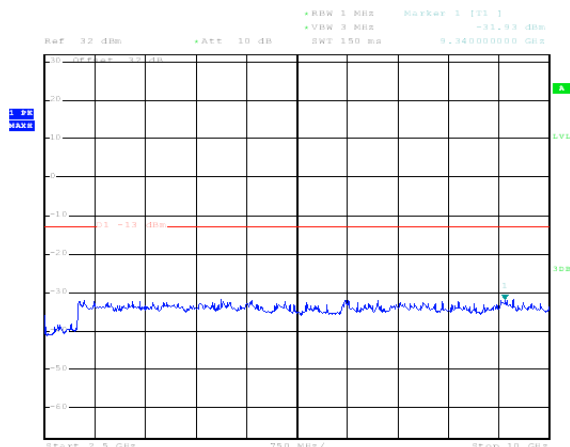
Date: 28.MAR.2013 11:23:51

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



Date: 28.MAR.2013 11:21:18

Figure 1-45a: GSM850 band, Spurious Conducted Emissions, Middle channel in EDGE Mode

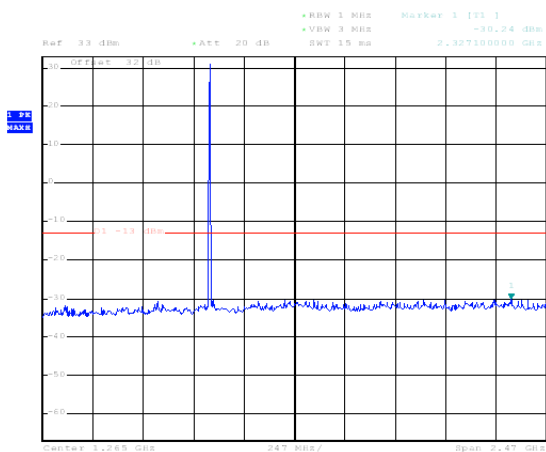


Date: 28.MAR.2013 11:23:25

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

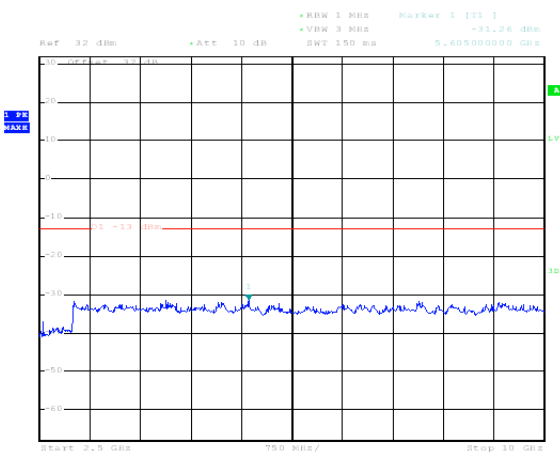
GSM Conducted RF Emission Test Data cont'd

Figure 1-46a: GSM850 band, Spurious Conducted Emissions, High channel in EDGE Mode



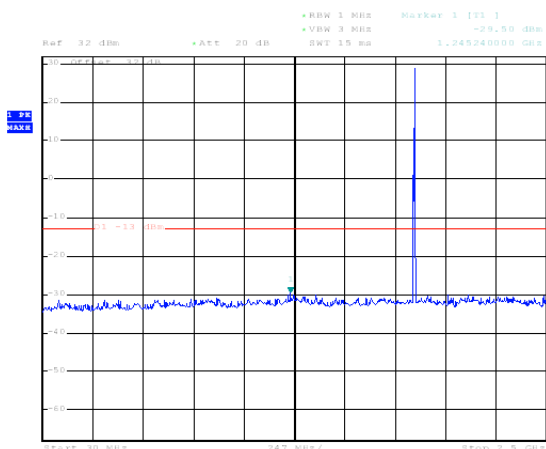
Date: 28.MAR.2013 11:21:55

Figure 1-47a: GSM850 band, Spurious Conducted Emissions, High channel in EDGE Mode



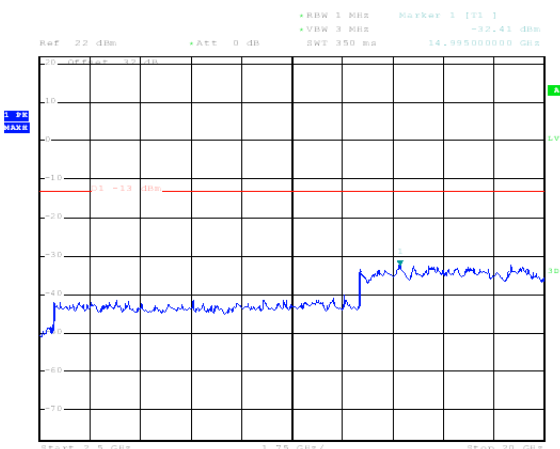
Date: 28.MAR.2013 11:22:56

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



Date: 28.MAR.2013 11:26:25

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

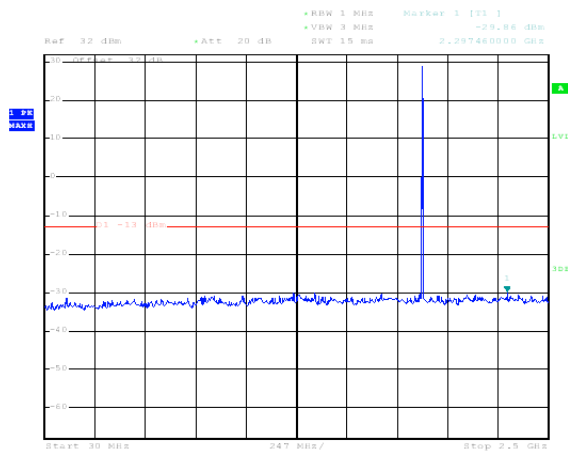


Date: 28.MAR.2013 11:30:04

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

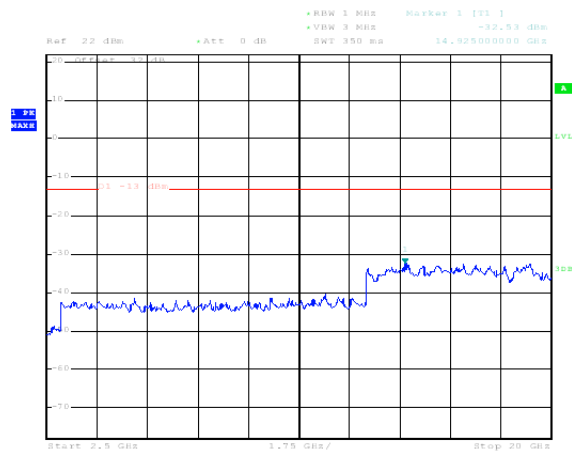
GSM Conducted RF Emission Test Data cont'd

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



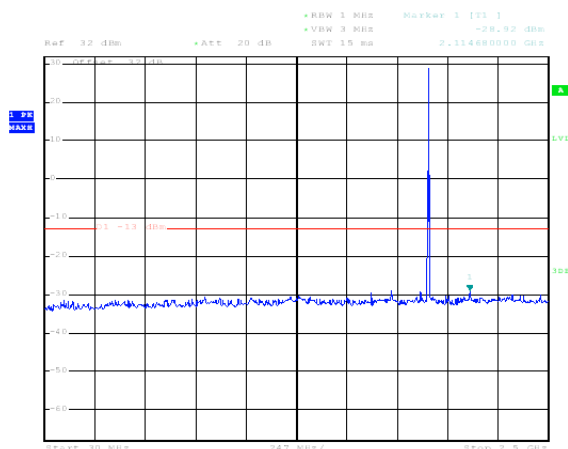
Date: 28.MAR.2013 11:26:57

Figure 1-51a: PCS1900 band, Spurious Conducted Emissions, middle channel in EDGE Mode



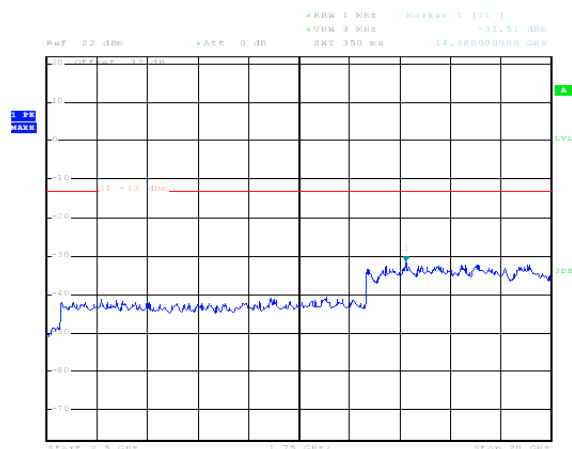
Date: 28.MAR.2013 11:29:25

Figure 1-52a: PCS1900 band, Spurious Conducted Emissions, High channel in EDGE Mode



Date: 28.MAR.2013 11:27:39

Figure 1-53a: PCS1900 band, Spurious Conducted Emissions, High channel in EDGE Mode

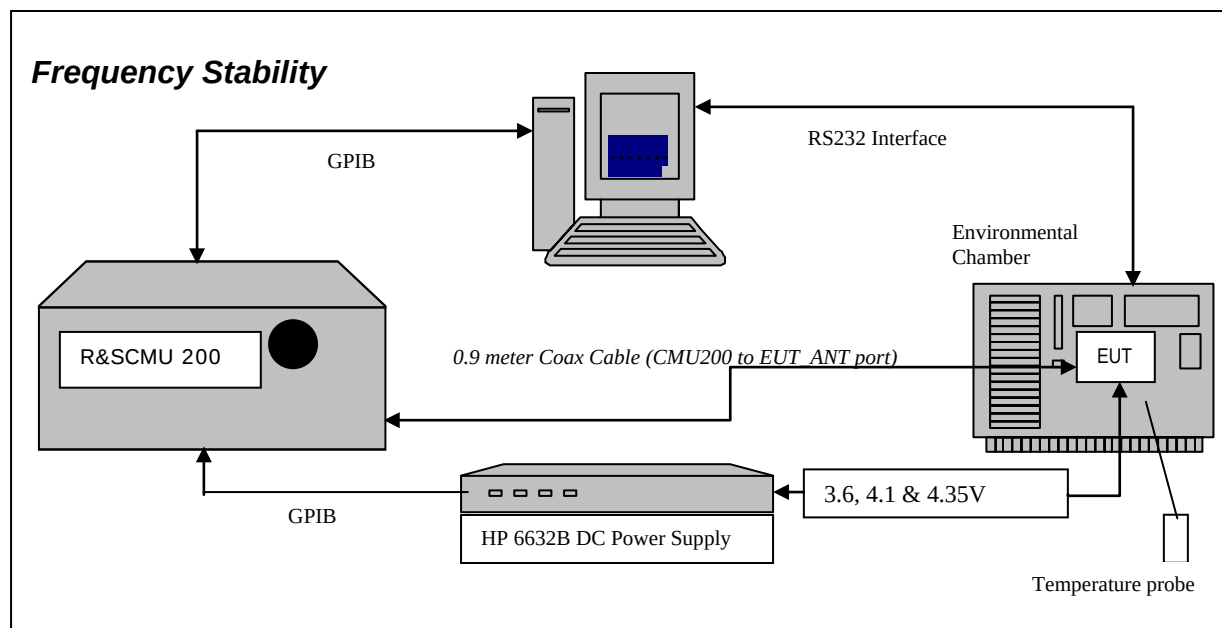


Date: 28.MAR.2013 11:28:55

APPENDIX 1B – GSM FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

GSM Frequency Stability Test Data



The measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.1055 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation

(d) Frequency Stability - Voltage Variation

The EUT meets the requirements as stated in CFR 47 chapter 1, RSS-132, 4.3 Frequency Stability.

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

Calibration for the Cable Loss was performed in the RF Laboratory using the Agilent power meter and Agilent Signal Generator.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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 **-0.0390 PPM**.
The maximum frequency error in the PCS1900 band measured was **-0.0257PPM**.

Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW
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The following measurements were performed on product RFS121LW.

Date of Test: March 28 - 29, 2013

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

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

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-5.36	-0.0065
189	836.40	3.6	20	4.26	0.0051
251	848.60	3.6	20	5.81	0.0068
Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.1	20	4.91	0.0060
189	836.40	4.1	20	6.84	0.0082
251	848.60	4.1	20	10.46	0.0123
Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.35	20	6.78	0.0082
189	836.40	4.35	20	5.36	0.0064
251	848.60	4.35	20	7.55	0.0089

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-22.02	-0.0267
128	824.20	3.6	-20	-17.18	-0.0208
128	824.20	3.6	-10	10.20	0.0124
128	824.20	3.6	0	-3.81	-0.0046
128	824.20	3.6	10	-10.91	-0.0132
128	824.20	3.6	20	-5.36	-0.0065
128	824.20	3.6	30	-5.49	-0.0067
128	824.20	3.6	40	7.75	0.0094
128	824.20	3.6	50	4.00	0.0049
128	824.20	3.6	60	5.94	0.0072
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.1	-30	-29.19	-0.0354
128	824.20	4.1	-20	-19.37	-0.0235
128	824.20	4.1	-10	10.59	0.0128
128	824.20	4.1	0	-9.56	-0.0116
128	824.20	4.1	10	-9.04	-0.0110
128	824.20	4.1	20	4.91	0.0060
128	824.20	4.1	30	-22.73	-0.0276
128	824.20	4.1	40	-4.71	-0.0057
128	824.20	4.1	50	-5.68	-0.0069
128	824.20	4.1	60	-6.26	-0.0076
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.35	-30	-31.45	-0.0382
128	824.20	4.35	-20	-27.25	-0.0331
128	824.20	4.35	-10	14.79	0.0179
128	824.20	4.35	0	-4.39	-0.0053
128	824.20	4.35	10	-11.69	-0.0142
128	824.20	4.35	20	6.78	0.0082
128	824.20	4.35	30	-15.05	-0.0183
128	824.20	4.35	40	4.52	0.0055
128	824.20	4.35	50	-10.14	-0.0123
128	824.20	4.35	60	-9.10	-0.0110

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-22.73	-0.0272
189	836.40	3.6	-20	-18.60	-0.0222
189	836.40	3.6	-10	12.66	0.0151
189	836.40	3.6	0	-4.58	-0.0055
189	836.40	3.6	10	-9.62	-0.0115
189	836.40	3.6	20	4.26	0.0051
189	836.40	3.6	30	-9.17	-0.0110
189	836.40	3.6	40	6.72	0.0080
189	836.40	3.6	50	-4.13	-0.0049
189	836.40	3.6	60	5.23	0.0063
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.1	-30	-24.54	-0.0293
189	836.40	4.1	-20	-21.95	-0.0262
189	836.40	4.1	-10	14.98	0.0179
189	836.40	4.1	0	-8.20	-0.0098
189	836.40	4.1	10	-7.94	-0.0095
189	836.40	4.1	20	6.84	0.0082
189	836.40	4.1	30	-15.56	-0.0186
189	836.40	4.1	40	3.87	0.0046
189	836.40	4.1	50	-6.59	-0.0079
189	836.40	4.1	60	-7.81	-0.0093
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.35	-30	-32.61	-0.0390
189	836.40	4.35	-20	-28.35	-0.0339
189	836.40	4.35	-10	19.89	0.0238
189	836.40	4.35	0	-4.58	-0.0055
189	836.40	4.35	10	-12.79	-0.0153
189	836.40	4.35	20	5.36	0.0064
189	836.40	4.35	30	-20.15	-0.0241
189	836.40	4.35	40	-6.65	-0.0080
189	836.40	4.35	50	-9.56	-0.0114
189	836.40	4.35	60	-9.43	-0.0113

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-28.67	-0.0338
251	848.8	3.6	-20	-16.79	-0.0198
251	848.8	3.6	-10	15.17	0.0179
251	848.8	3.6	0	-6.39	-0.0075
251	848.8	3.6	10	-7.55	-0.0089
251	848.8	3.6	20	5.81	0.0068
251	848.8	3.6	30	-25.31	-0.0298
251	848.8	3.6	40	8.91	0.0105
251	848.8	3.6	50	4.33	0.0051
251	848.8	3.6	60	4.39	0.0052
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	4.1	-30	-29.32	-0.0345
251	848.8	4.1	-20	-24.34	-0.0287
251	848.8	4.1	-10	15.82	0.0186
251	848.8	4.1	0	-11.11	-0.0131
251	848.8	4.1	10	-10.85	-0.0128
251	848.8	4.1	20	10.46	0.0123
251	848.8	4.1	30	-16.47	-0.0194
251	848.8	4.1	40	-5.29	-0.0062
251	848.8	4.1	50	-6.20	-0.0073
251	848.8	4.1	60	-6.59	-0.0078
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	4.35	-30	-24.92	-0.0294
251	848.8	4.35	-20	-28.86	-0.0340
251	848.8	4.35	-10	20.34	0.0240
251	848.8	4.35	0	4.78	0.0056
251	848.8	4.35	10	-10.98	-0.0129
251	848.8	4.35	20	7.55	0.0089
251	848.8	4.35	30	-14.46	-0.0170
251	848.8	4.35	40	-12.59	-0.0148
251	848.8	4.35	50	-10.72	-0.0126
251	848.8	4.35	60	-6.39	-0.0075

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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	-4.84	-0.0026
661	1880.00	3.6	20	-7.49	-0.0040
810	1909.80	3.6	20	-19.57	-0.0102
Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.1	20	-27.12	-0.0147
661	1880.00	4.1	20	-16.79	-0.0089
810	1909.80	4.1	20	-17.18	-0.0090
Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.35	20	-14.53	-0.0079
661	1880.00	4.35	20	-13.17	-0.0070
810	1909.80	4.35	20	-16.72	-0.0088

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-27.31	-0.0148
512	1850.20	3.6	-20	-21.50	-0.0116
512	1850.20	3.6	-10	-23.05	-0.0125
512	1850.20	3.6	0	-10.46	-0.0057
512	1850.20	3.6	10	-11.30	-0.0061
512	1850.20	3.6	20	-4.84	-0.0026
512	1850.20	3.6	30	11.24	0.0061
512	1850.20	3.6	40	-25.51	-0.0138
512	1850.20	3.6	50	11.04	0.0060
512	1850.20	3.6	60	11.11	0.0060
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.1	-30	-40.74	-0.0220
512	1850.20	4.1	-20	-35.71	-0.0193
512	1850.20	4.1	-10	-29.70	-0.0161
512	1850.20	4.1	0	-13.30	-0.0072
512	1850.20	4.1	10	-23.31	-0.0126
512	1850.20	4.1	20	-27.12	-0.0147
512	1850.20	4.1	30	16.79	0.0091
512	1850.20	4.1	40	-27.06	-0.0146
512	1850.20	4.1	50	-9.10	-0.0049
512	1850.20	4.1	60	-7.75	-0.0042
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.35	-30	-44.88	-0.0243
512	1850.20	4.35	-20	-42.81	-0.0231
512	1850.20	4.35	-10	-31.64	-0.0171
512	1850.20	4.35	0	-12.66	-0.0068
512	1850.20	4.35	10	-16.01	-0.0087
512	1850.20	4.35	20	-14.53	-0.0079
512	1850.20	4.35	30	13.88	0.0075
512	1850.20	4.35	40	-22.47	-0.0121
512	1850.20	4.35	50	-15.63	-0.0084
512	1850.20	4.35	60	-18.92	-0.0102

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-25.05	-0.0133
661	1880.00	3.6	-20	-23.96	-0.0127
661	1880.00	3.6	-10	-20.99	-0.0112
661	1880.00	3.6	0	-12.07	-0.0064
661	1880.00	3.6	10	-11.36	-0.0060
661	1880.00	3.6	20	-7.49	-0.0040
661	1880.00	3.6	30	16.92	0.0090
661	1880.00	3.6	40	-22.15	-0.0118
661	1880.00	3.6	50	14.66	0.0078
661	1880.00	3.6	60	11.30	0.0060
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	4.1	-30	-37.13	-0.0198
661	1880.00	4.1	-20	-33.96	-0.0181
661	1880.00	4.1	-10	-33.25	-0.0177
661	1880.00	4.1	0	-11.56	-0.0061
661	1880.00	4.1	10	-17.43	-0.0093
661	1880.00	4.1	20	-16.79	-0.0089
661	1880.00	4.1	30	19.89	0.0106
661	1880.00	4.1	40	-20.28	-0.0108
661	1880.00	4.1	50	-5.81	-0.0031
661	1880.00	4.1	60	-10.14	-0.0054
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	4.35	-30	-41.91	-0.0223
661	1880.00	4.35	-20	-28.02	-0.0149
661	1880.00	4.35	-10	-32.16	-0.0171
661	1880.00	4.35	0	-12.33	-0.0066
661	1880.00	4.35	10	-18.66	-0.0099
661	1880.00	4.35	20	-13.17	-0.0070
661	1880.00	4.35	30	18.08	0.0096
661	1880.00	4.35	40	-14.98	-0.0080
661	1880.00	4.35	50	-16.53	-0.0088
661	1880.00	4.35	60	-15.11	-0.0080

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-22.86	-0.0120
810	1909.80	3.6	-20	-28.28	-0.0148
810	1909.80	3.6	-10	-21.50	-0.0113
810	1909.80	3.6	0	6.91	0.0036
810	1909.80	3.6	10	-17.11	-0.0090
810	1909.80	3.6	20	-19.57	-0.0102
810	1909.80	3.6	30	20.02	0.0105
810	1909.80	3.6	40	-15.82	-0.0083
810	1909.80	3.6	50	16.53	0.0087
810	1909.80	3.6	60	12.20	0.0064
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	4.1	-30	-39.26	-0.0206
810	1909.80	4.1	-20	-32.67	-0.0171
810	1909.80	4.1	-10	-32.93	-0.0172
810	1909.80	4.1	0	-13.17	-0.0069
810	1909.80	4.1	10	-20.21	-0.0106
810	1909.80	4.1	20	-17.18	-0.0090
810	1909.80	4.1	30	18.14	0.0095
810	1909.80	4.1	40	-24.09	-0.0126
810	1909.80	4.1	50	-11.75	-0.0062
810	1909.80	4.1	60	-12.14	-0.0064
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	4.35	-30	-49.01	-0.0257
810	1909.80	4.35	-20	-24.28	-0.0127
810	1909.80	4.35	-10	-28.28	-0.0148
810	1909.80	4.35	0	4.39	0.0023
810	1909.80	4.35	10	-17.76	-0.0093
810	1909.80	4.35	20	-16.72	-0.0088
810	1909.80	4.35	30	17.11	0.0090
810	1909.80	4.35	40	-12.01	-0.0063
810	1909.80	4.35	50	-16.72	-0.0088
810	1909.80	4.35	60	-16.14	-0.0085

APPENDIX 1C – GSM RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Power Test Data Results

The following measurements were performed on product RFS121LW.

Date of test: April 01, 2013

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 25.6 °C
Relative Humidity: 15.0 %

The BlackBerry® smartphone was standalone, horizontally with LCD facing down and top 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)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	128	824.20	850	Dipole	V	-30.30	-21.73	V-V	13.61	30.74	1.19	38.50	-7.76
F0	128	824.20	850	Dipole	H	-21.73		H-H	11.70				
F0	190	836.60	850	Dipole	V	-31.11	-22.19	V-V	13.04	29.84	0.96	38.50	-8.66
F0	190	836.60	850	Dipole	H	-22.19		H-H	11.86				
F0	251	848.80	850	Dipole	V	-30.90	-22.63	V-V	13.51	30.29	1.07	38.50	-8.21
F0	251	848.80	850	Dipole	H	-22.63		H-H	12.49				

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)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	128	824.20	850	Dipole	V	-32.32	-23.74	V-V	11.58	28.71	0.74	38.50	-9.79
F0	128	824.20	850	Dipole	H	-23.74		H-H	9.69				
F0	190	836.60	850	Dipole	V	-33.03	-24.03	V-V	11.17	27.97	0.63	38.50	-10.53
F0	190	836.60	850	Dipole	H	-24.03		H-H	10.01				
F0	251	848.80	850	Dipole	V	-32.31	-24.27	V-V	11.83	28.61	0.73	38.50	-9.89
F0	251	848.80	850	Dipole	H	-24.27		H-H	10.81				

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Power Test Data Results cont'd

Date of test: April 24, 2013

The following measurements were performed by Mahmood Ahmed.

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

The BlackBerry® smartphone was standalone, horizontal with LCD facing up and head 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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	512	1850.20	1900	Horn	V	89.37	91.14	V-V	-2.6	32.37	1.73	33.00	-0.63
F0	512	1850.20	1900	Horn	H	91.14		H-H	-2.44				
F0	661	1880.00	1900	Horn	V	89.08	90.12	V-V	-2.50	32.40	1.74	33.00	-0.60
F0	661	1880.00	1900	Horn	H	90.12		H-H	-2.87				
F0	810	1909.80	1900	Horn	V	88.31	89.79	V-V	-1.9	32.05	1.60	33.00	-0.95
F0	810	1909.80	1900	Horn	H	89.79		H-H	-1.9				

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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	512	1850.20	1900	Horn	V	88.98	90.4	V-V	-3.4	31.61	1.45	33.00	-1.39
F0	512	1850.20	1900	Horn	H	90.4		H-H	-3.2				
F0	661	1880.00	1900	Horn	V	88.37	89.27	V-V	-3.20	31.70	1.48	33.00	-1.30
F0	661	1880.00	1900	Horn	H	89.27		H-H	-3.60				
F0	810	1909.80	1900	Horn	V	88.67	88.9	V-V	-2.88	31.07	1.28	33.00	-1.93
F0	810	1909.80	1900	Horn	H	88.9		H-H	-2.9				

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results cont'd

GSM850 Call Mode

Date of Test: March 06, 2013

The following measurements were performed by Berkin Can.

The environmental test conditions were: Temperature: 25.7 °C
 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, horizontal with LCD 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: March 06 - 19, 2012

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 24.5 - 25.4 °C
 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 Call Tx mode, channels 128, 190, 251.

All emissions were at least 25.0 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results cont'd

PCS1900 CALL Mode

Date of Test: March 07, 2013

The following measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 25.7 °C
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, horizontal with LCD facing up and top pointing 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: March 06 – 26, 2013

The following measurements were performed by Mahmood Ahmed.

The environmental test conditions were: Temperature: 24.3 – 25.4 °C
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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results cont'd

The following measurements were performed on product RFS121LW.

Date of test: April 09, 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 down and top 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 (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	128	824.20	850	Dipole	V	-30.90	-21.80	V-V	12.67	29.80	0.95	38.50	-8.70
F0	128	824.20	850	Dipole	H	-21.80		H-H	10.98				
F0	190	836.60	850	Dipole	V	-31.45	-21.72	V-V	13.22	30.02	1.00	38.50	-8.48
F0	190	836.60	850	Dipole	H	-21.72		H-H	11.88				
F0	251	848.80	850	Dipole	V	-30.36	-22.56	V-V	13.32	30.10	1.02	38.50	-8.40
F0	251	848.80	850	Dipole	H	-22.56		H-H	12.65				

GSM850 Band in EDGE 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)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	128	824.20	850	Dipole	V	-33.73	-24.80	V-V	9.63	26.76	0.47	38.50	-11.74
F0	128	824.20	850	Dipole	H	-24.80		H-H	7.90				
F0	190	836.60	850	Dipole	V	-33.91	-24.74	V-V	10.15	26.95	0.50	38.50	-11.55
F0	190	836.60	850	Dipole	H	-24.74		H-H	8.84				
F0	251	848.80	850	Dipole	V	-33.51	-25.12	V-V	10.76	27.54	0.57	38.50	-10.96
F0	251	848.80	850	Dipole	H	-25.12		H-H	10.02				

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 1C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW	

Radiated Power Test Data Results cont'd

Date of test: March 31, 2013

The following measurements were performed by Mahmood Ahmed.

The environmental tests conditions were: Temperature: 24.3 °C
 Relative Humidity: 32.8 %

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and head 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

EUT								Substitution Method					
				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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	512	1850.20	1900	Horn	V	91.0	91.58	V-V	-2.6	32.93	1.96	33.00	-0.07
F0	512	1850.20	1900	Horn	H	91.58		H-H	-2.44				
F0	661	1880.00	1900	Horn	V	89.57	90.68	V-V	-2.50	32.90	1.95	33.00	-0.10
F0	661	1880.00	1900	Horn	H	90.68		H-H	-2.87				
F0	810	1909.80	1900	Horn	V	90.54	90.54	V-V	-1.9	32.69	1.86	33.00	-0.31
F0	810	1909.80	1900	Horn	H	90.31		H-H	-1.9				

PCS1900 Band in EDGE Mode

EUT								Substitution Method					
				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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	512	1850.20	1900	Horn	V	89.82	90.77	V-V	-2.86	32.09	1.62	33.00	-0.91
F0	512	1850.20	1900	Horn	H	90.77		H-H	-2.72				
F0	661	1880.00	1900	Horn	V	88.99	89.61	V-V	-2.50	32.40	1.74	33.00	-0.60
F0	661	1880.00	1900	Horn	H	89.61		H-H	-2.90				
F0	810	1909.80	1900	Horn	V	89.33	89.33	V-V	-2.48	31.47	1.40	33.00	-1.53
F0	810	1909.80	1900	Horn	H	88.95		H-H	-2.5				

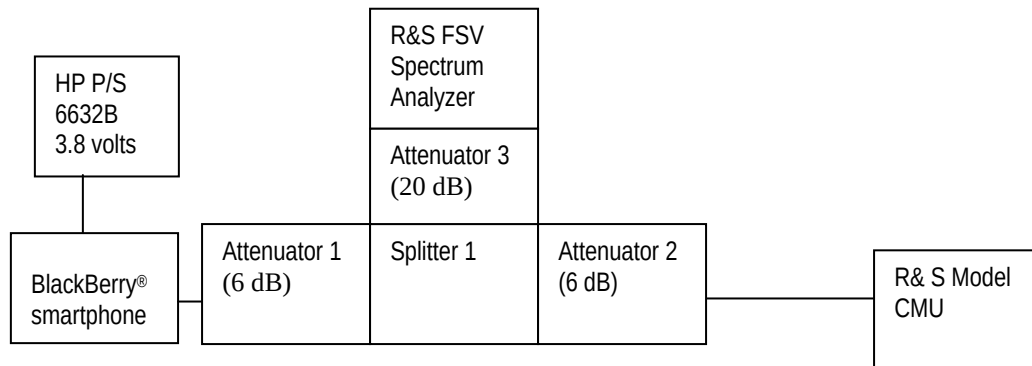
APPENDIX 2A – WCDMA Band 5/2/4 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: March 19 - 27, 2013

The environmental test conditions were: Temperature: 23.4 – 23.7 °C
 Relative Humidity: 21.9 - 26.1 %

The following measurements were performed by Berkin Can.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

The following measurements were performed on product RFS121LW.

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

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.

The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.

The worst case –26dBc bandwidth were measured to be 4.602 MHz for WCDMA Band 5, 4.595 MHz for the WCDMA Band 2 and 4.581MHz for WCDMA Band 4 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 5/2/4 selected Frequencies in Voice mode

WCDMA Band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.565	4.135
836.400	4.570	4.145
846.600	4.564	4.150

WCDMA Band 2 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.575	4.150
1880.000	4.583	4.150
1907.600	4.570	4.145

WCDMA Band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1712.4	4.581	4.162
1732.6	4.573	4.146
1752.6	4.573	4.153

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Peak to Average Ratio (PAR) for WCDMA Band 2/4

The peak to average ratio was measured on the low, middle and high channels.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied.
The worst case measured was 3.68 dB on the low channel of WCDMA Band 2.
The worst case measured was 3.59 dB on low and high channels of WCDMA Band 4.

Measurement Plots for WCDMA Band 5/2/4 Voice mode

The measurement plots on product RFS121LW:
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).

The measurement plots on product RFR101LW:
See Figures 2-1b to 2-6b for the plots of the conducted spurious emissions.
See Figures 2-7b to 2-12b for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.
See Figures 2-13b to 2-14b for the plots of the Channel mask.
See Figures 2-15b to 2-17b for the plots of the Peak to Average Ratio (WCDMA Band 4).

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 22 Subpart H, RSS-132, RSS - 133 and RSS – 139, were measured from 30 MHz to 20 GHz.

Test Data for WCDMA Band 2/4/5 selected Frequencies in HSUPA mode

WCDMA Band 5 Frequency (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.135
836.400	4.155
846.600	4.155

WCDMA Band 2 Frequency (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.165
1880.000	4.160
1907.600	4.155

WCDMA Band 4 Frequency (MHz)	99% Occupied Bandwidth (MHz)
1712.4	4.153
1732.6	4.153
1752.6	4.153

Measurement Plots for WCDMA Band 5/2/4 in HSUPA mode

Refer to the following measurement plots for more detail:

The measurement plots for product RFS121LW:

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.

The measurement plots for product RFR101LW:

See Figures 2-18b to 2-23b for the plots of the conducted spurious emissions.

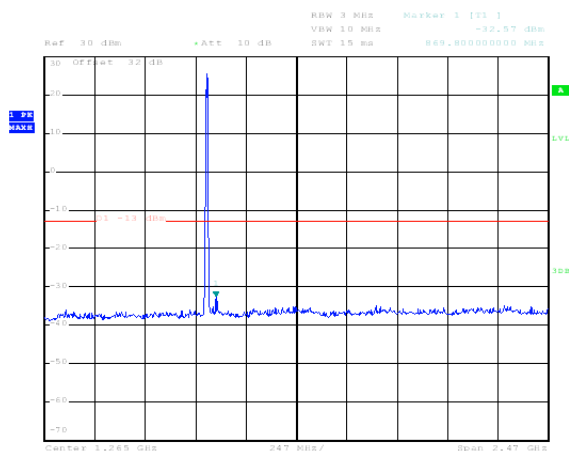
See Figures 2-24b to 2-26b for the plots of 99% Occupied Bandwidth.

See Figures 2-27b to 2-28b for the plots of the Channel mask.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

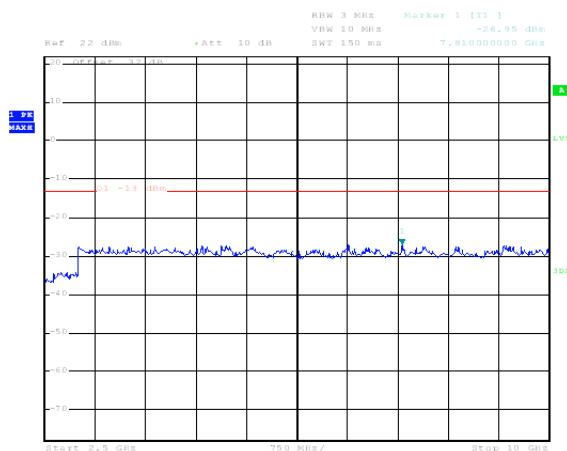
WCDMA Conducted RF Emission Test Data cont'd

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



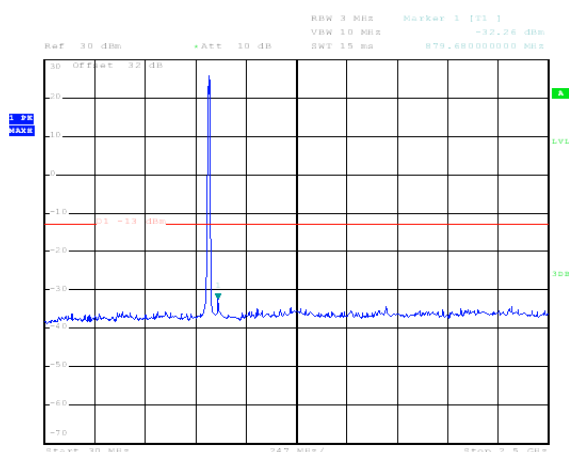
Date: 27.MAR.2013 14:17:08

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



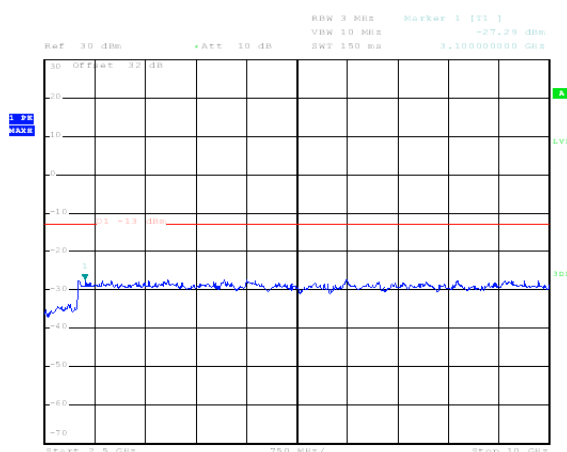
Date: 27.MAR.2013 14:13:03

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



Date: 27.MAR.2013 14:16:28

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

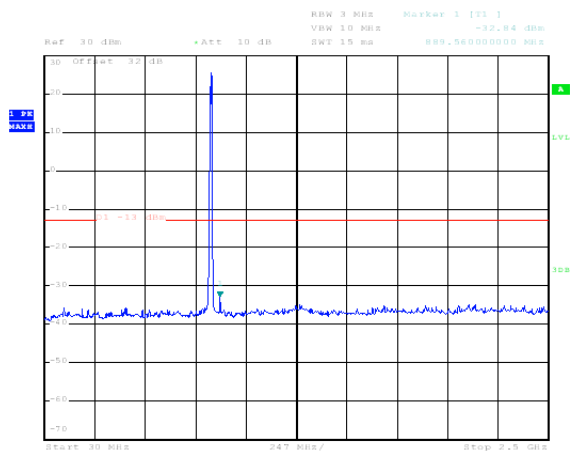


Date: 27.MAR.2013 14:17:55

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

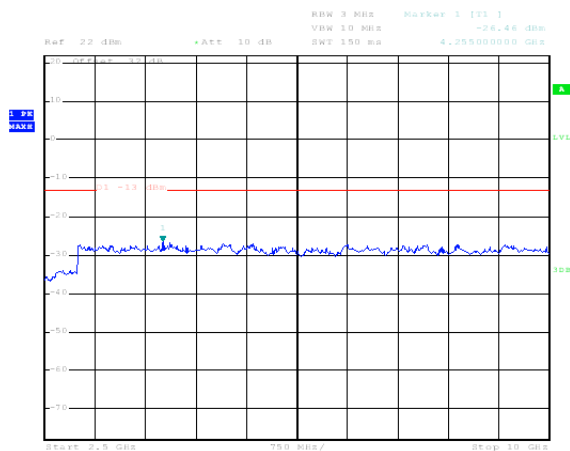
WCDMA Conducted RF Emission Test Data cont'd

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



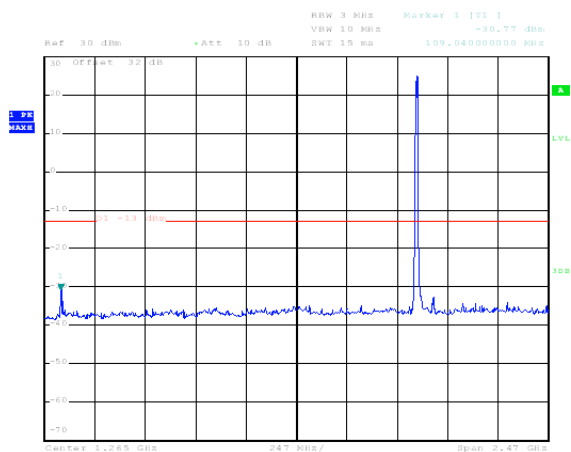
Date: 27.MAR.2013 14:15:28

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



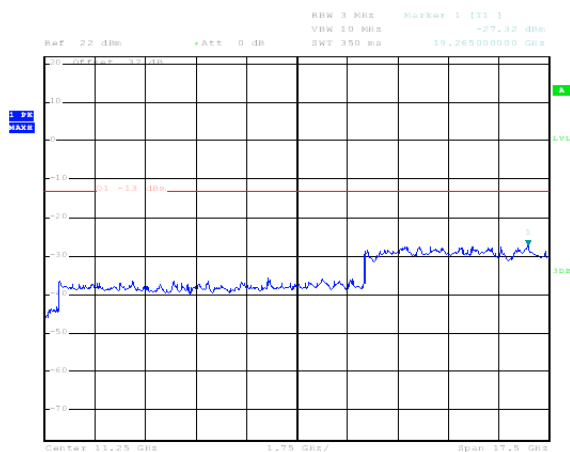
Date: 27.MAR.2013 14:14:35

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



Date: 27.MAR.2013 14:08:26

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

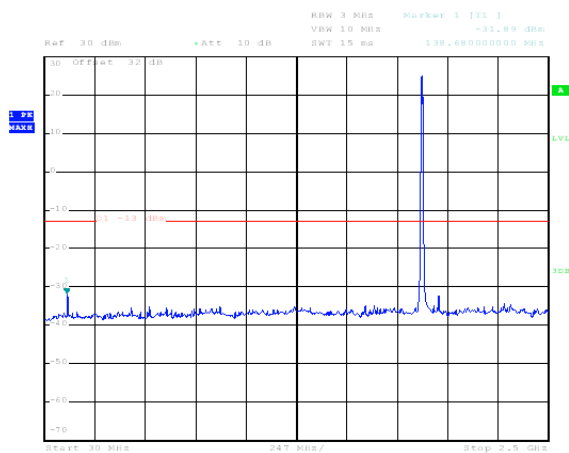


Date: 27.MAR.2013 14:10:26

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

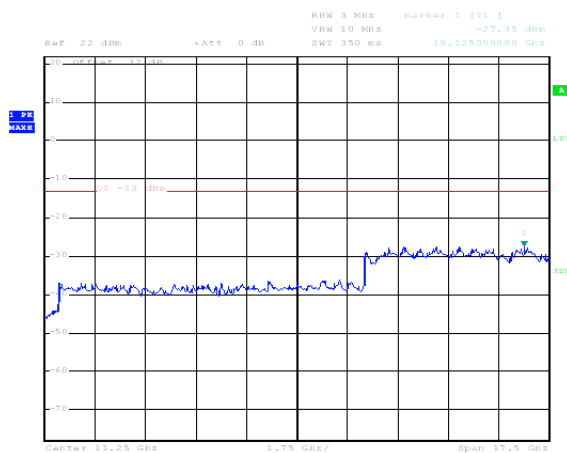
WCDMA Conducted RF Emission Test Data cont'd

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



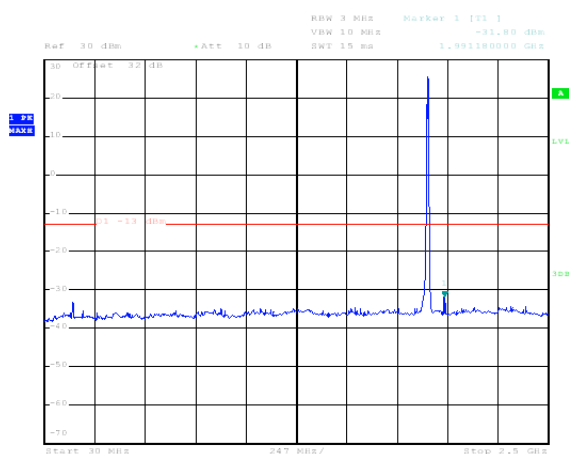
Date: 27.MAR.2013 14:07:51

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



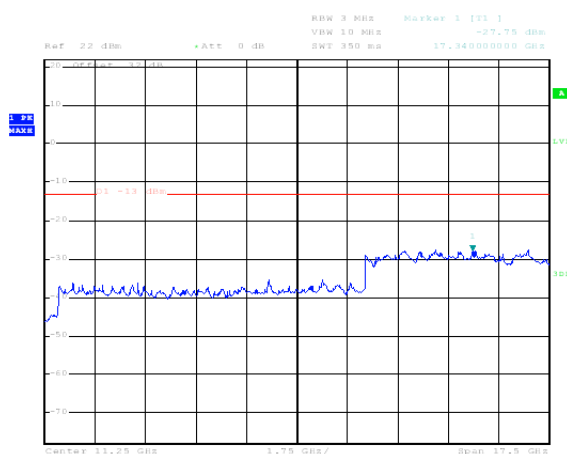
Date: 27.MAR.2013 14:10:53

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



Date: 27.MAR.2013 14:06:37

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



Date: 27.MAR.2013 14:11:24

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

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

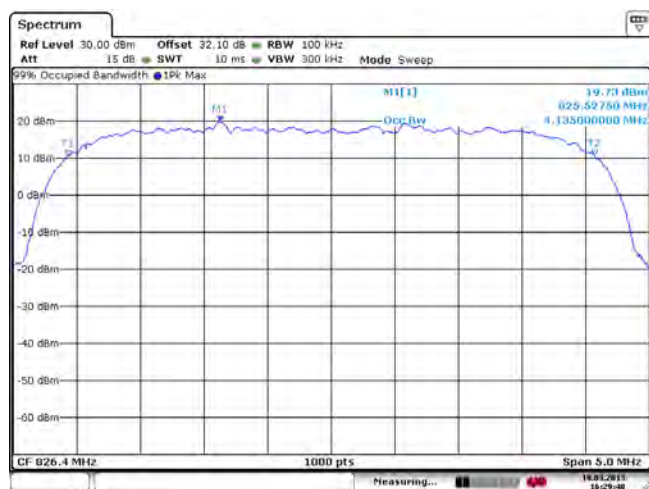


Figure 2-14a: Occupied Bandwidth, Band 5 Middle Channel

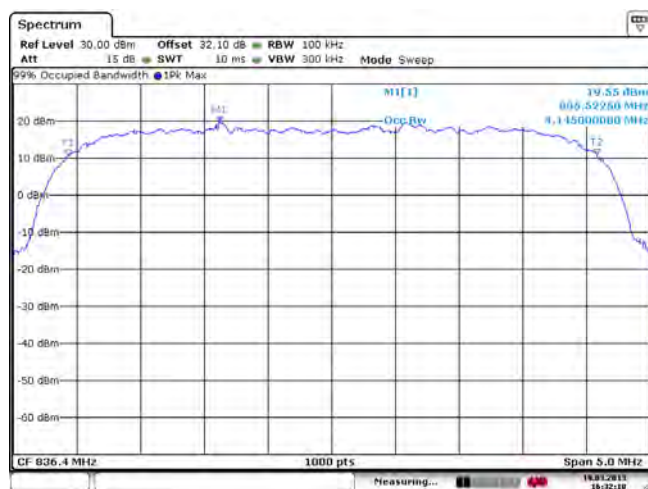


Figure 2-15a: Occupied Bandwidth, Band 5 High Channel

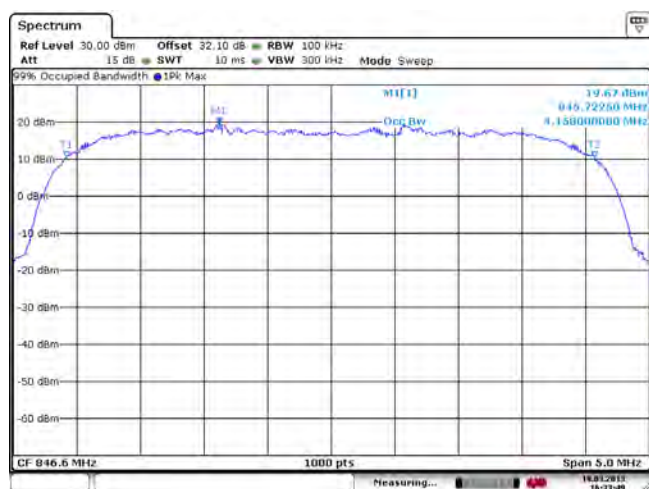
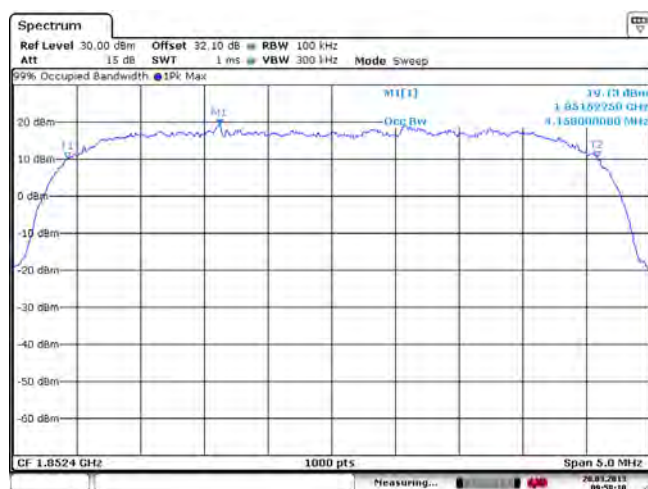


Figure 2-16a: Occupied Bandwidth, Band 2 Low Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

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

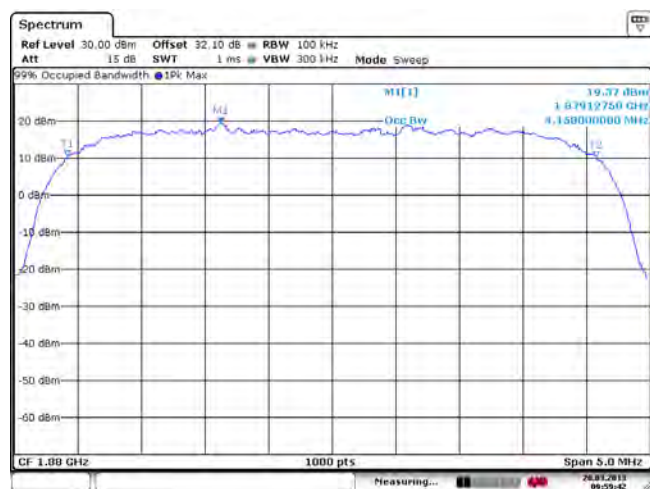


Figure 2-18a: Occupied Bandwidth, Band 2 High Channel



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

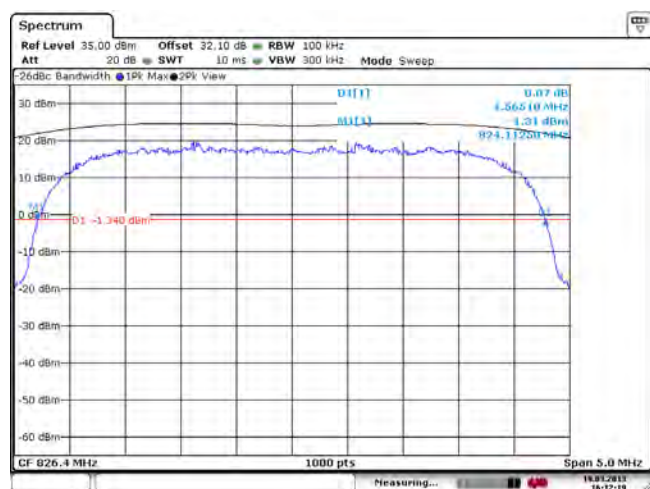
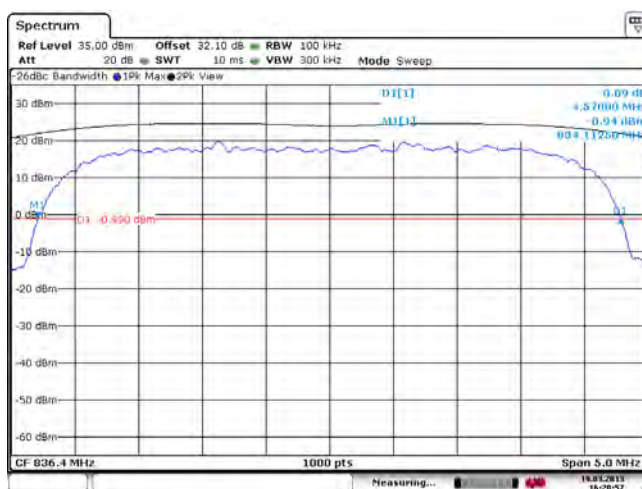


Figure 2-20a: -26 dBc Bandwidth, Band 5 Middle Channel



WCDMA Conducted RF Emission Test Data cont'd

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

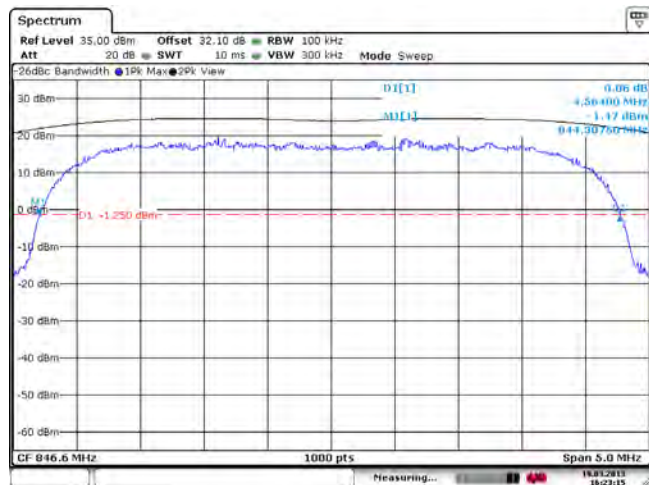


Figure 2-22a: -26 dBc Bandwidth, Band 2 Low Channel

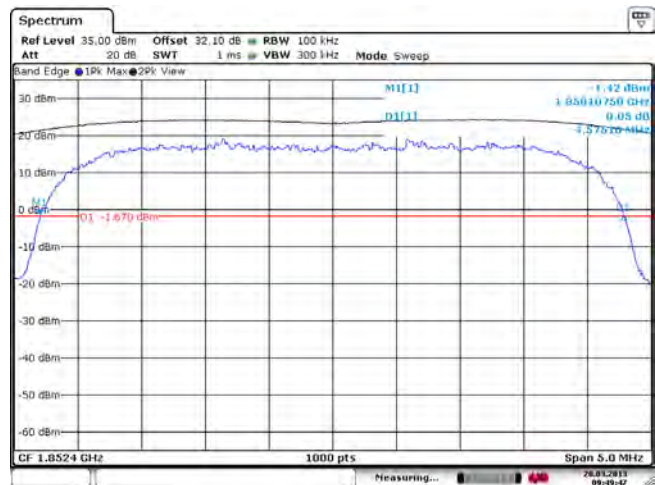


Figure 2-23a: -26 dBc Bandwidth, Band 2 Middle Channel

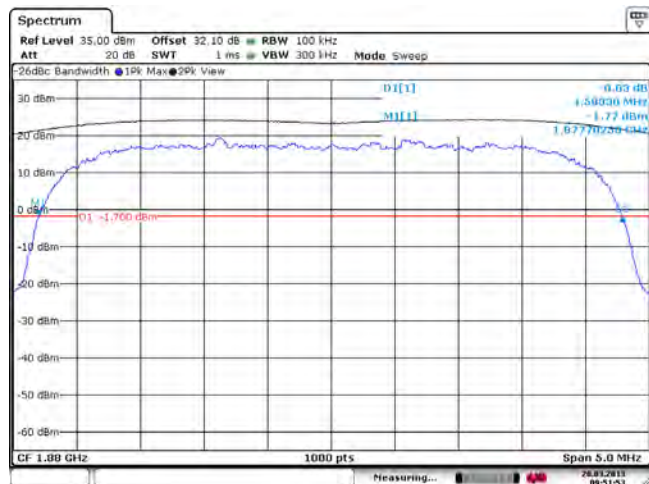
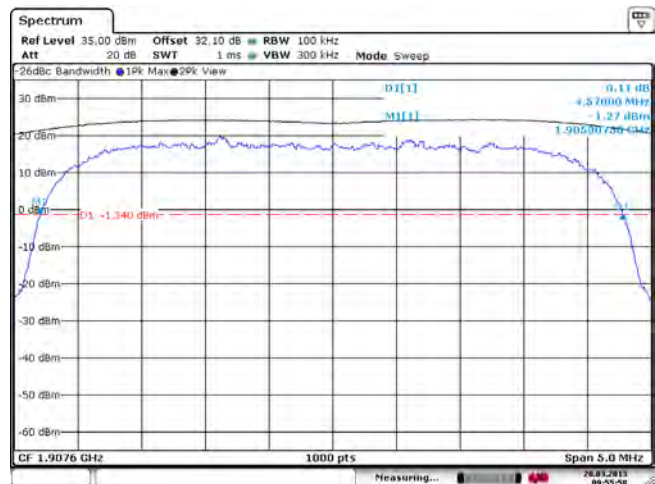


Figure 2-24a: -26 dBc Bandwidth, Band 2 High Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

Figure 2-25a: Band 5 Low Channel Mask

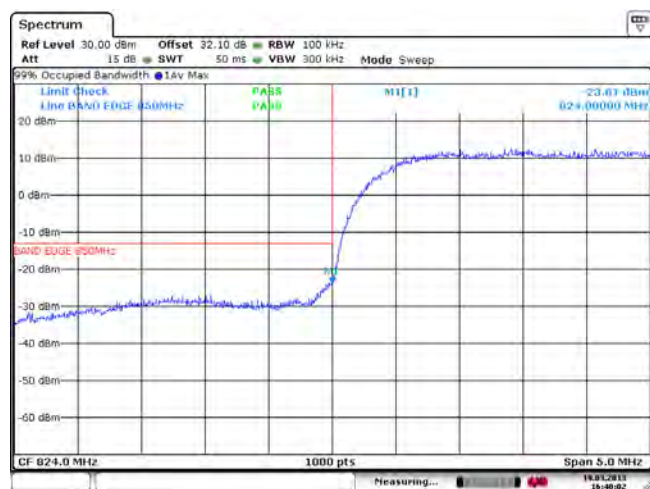


Figure 2-26a: Band 5 High Channel Mask

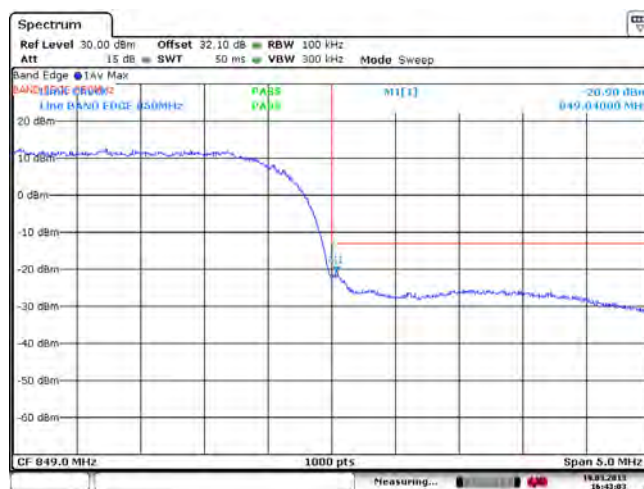


Figure 2-27a: Band 2 Low Channel Mask

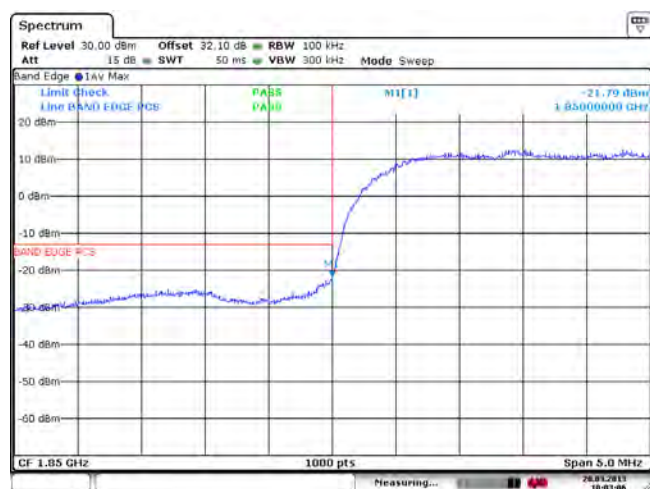
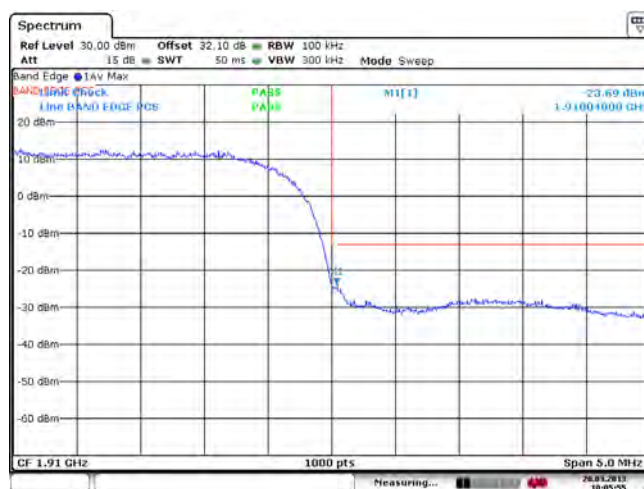


Figure 2-28a: Band 2 High Channel Mask



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

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



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

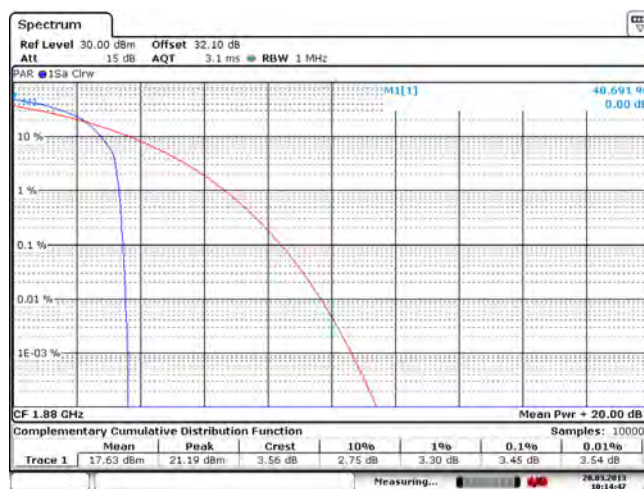
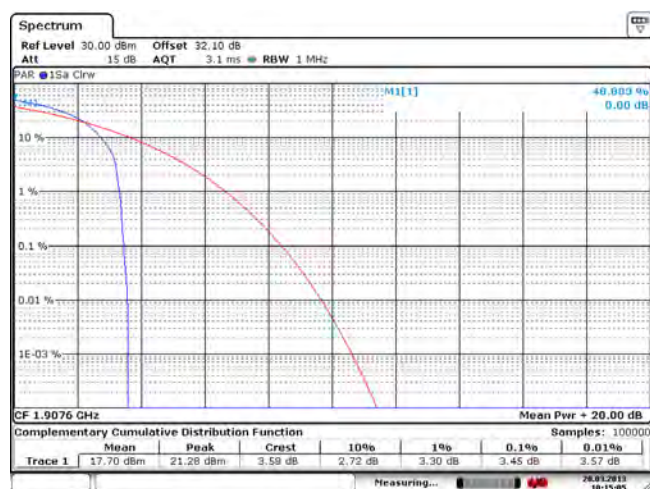


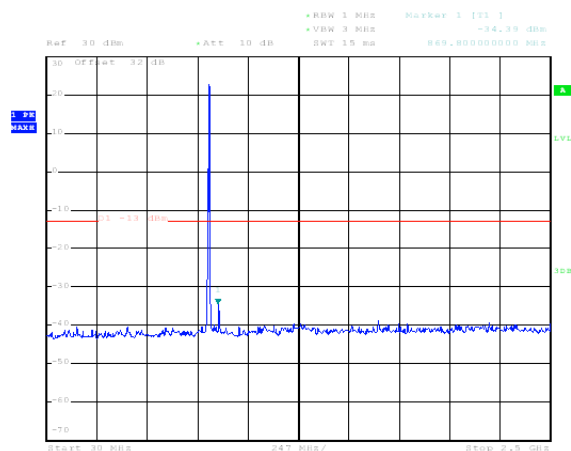
Figure 2-31a: Band 2, PAR High Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

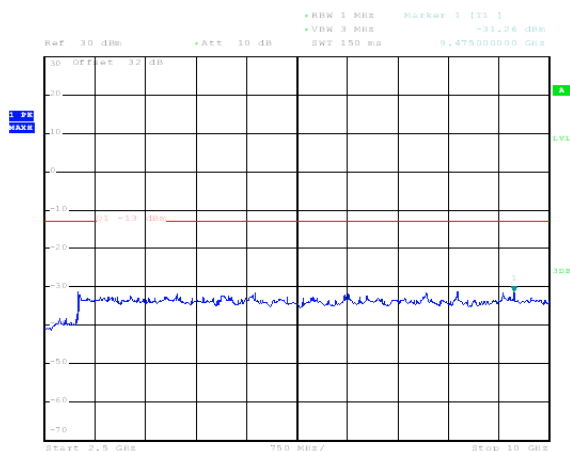
WCDMA Conducted RF Emission Test Data cont'd

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



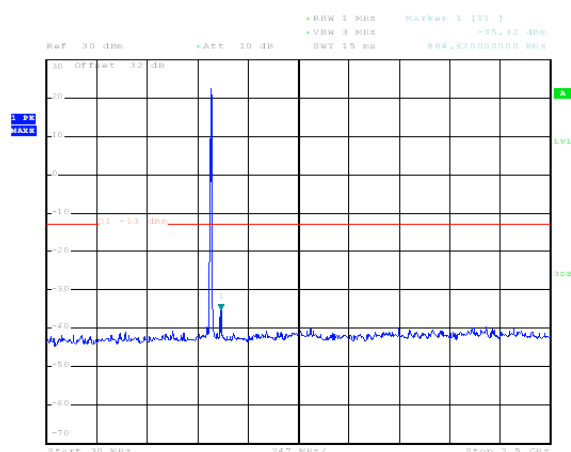
Date: 28.MAR.2013 10:49:37

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



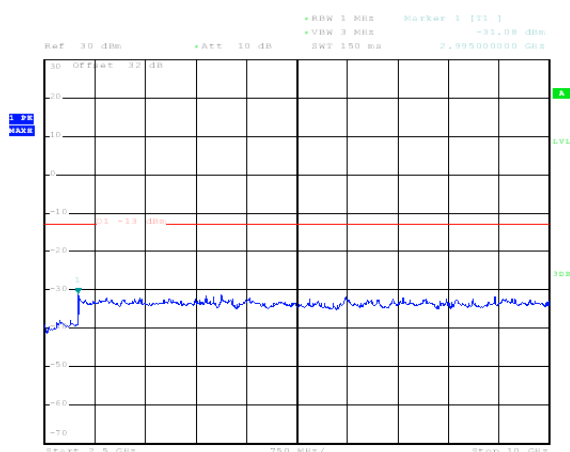
Date: 28.MAR.2013 10:45:22

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



Date: 28.MAR.2013 10:48:55

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

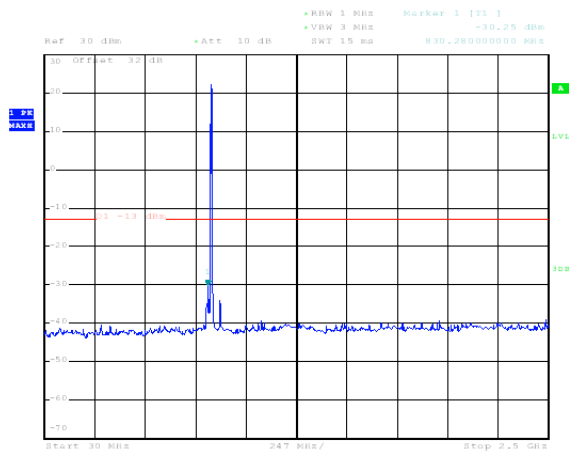


Date: 28.MAR.2013 10:47:00

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

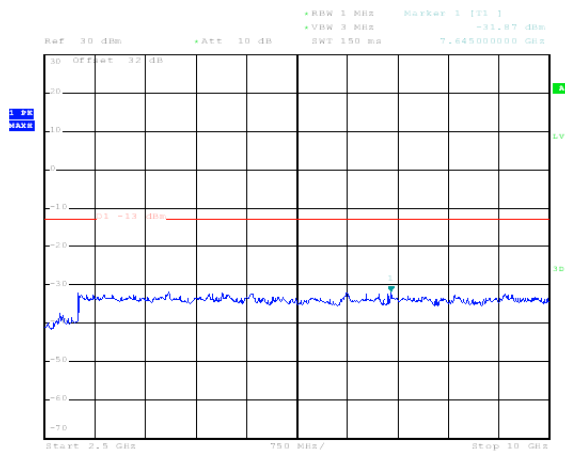
WCDMA Conducted RF Emission Test Data cont'd

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



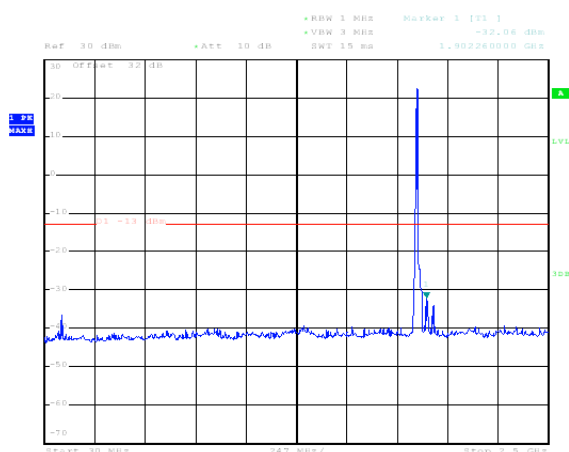
Date: 28.MAR.2013 10:48:31

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



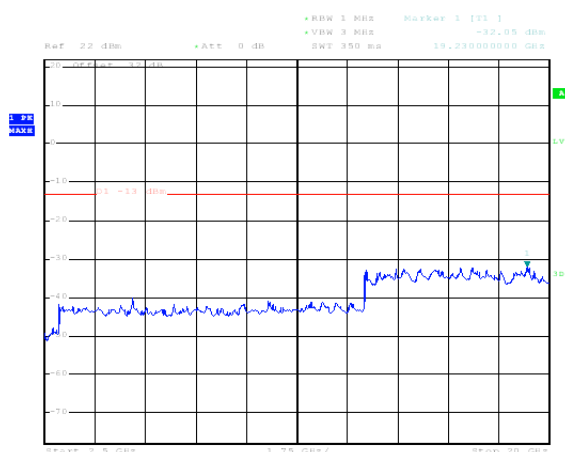
Date: 28.MAR.2013 10:47:40

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



Date: 28.MAR.2013 10:52:16

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

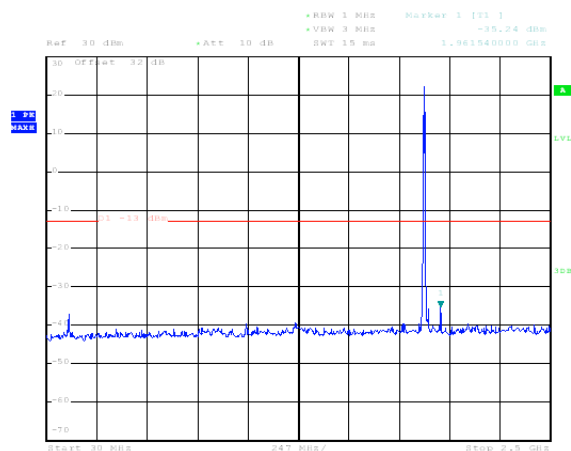


Date: 28.MAR.2013 10:53:14

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

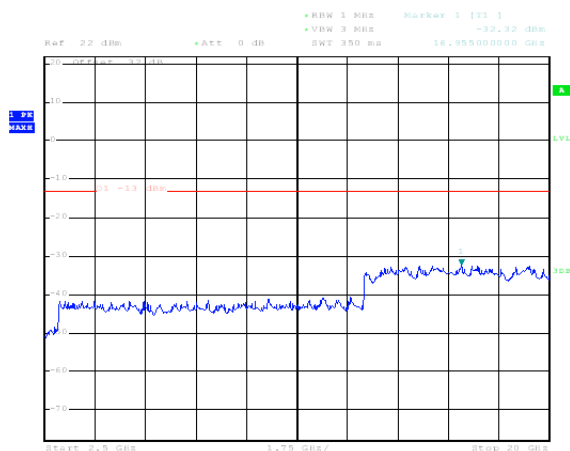
WCDMA Conducted RF Emission Test Data cont'd

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



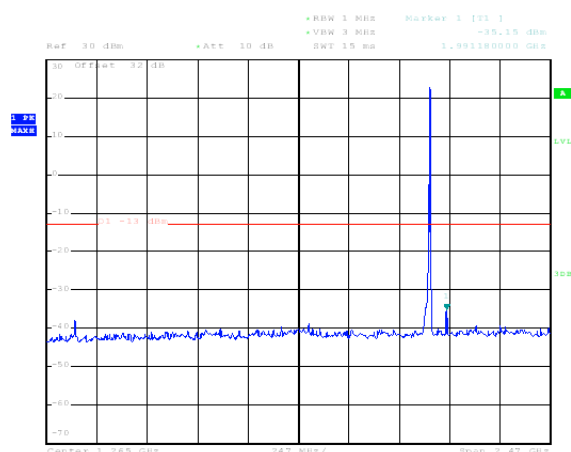
Date: 28.MAR.2013 10:51:27

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



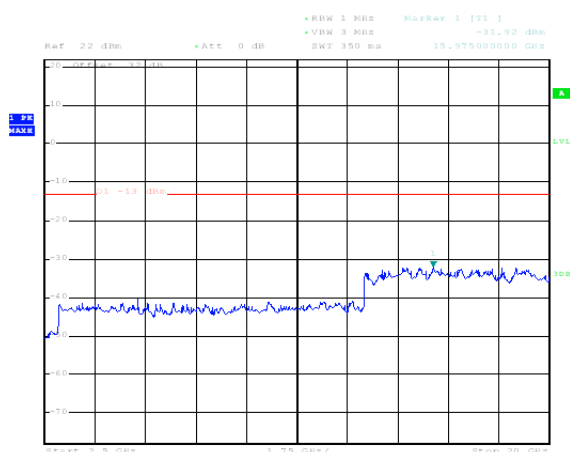
Date: 28.MAR.2013 10:53:54

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



Date: 28.MAR.2013 10:50:53

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

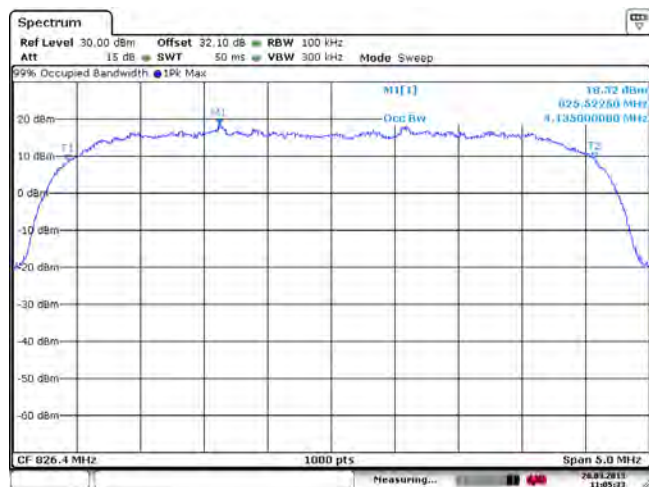


Date: 28.MAR.2013 10:55:05

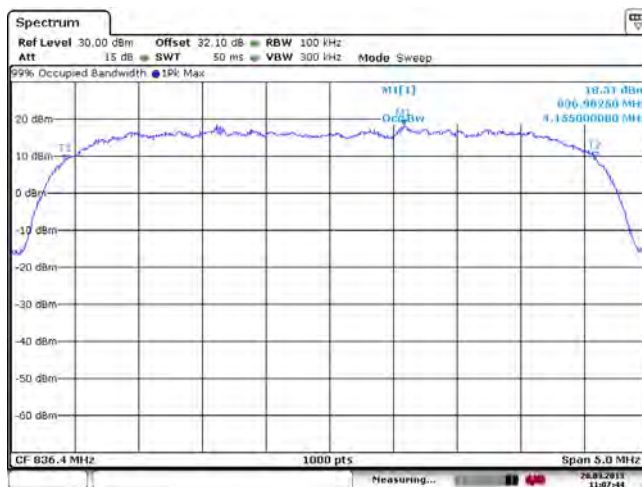
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

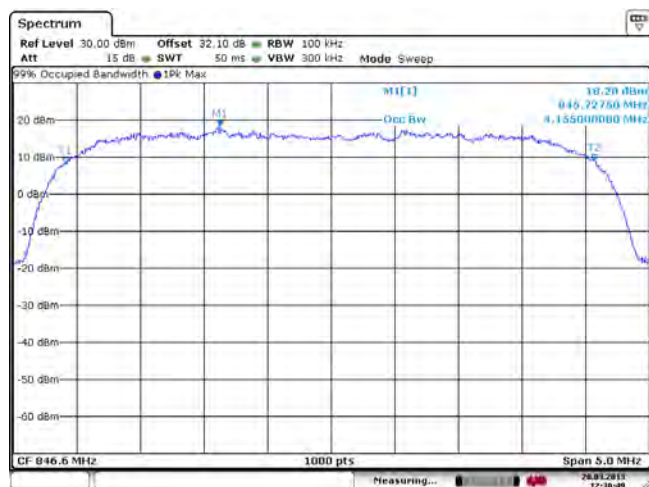
**Figure 2-44a: Occupied Bandwidth, Band 5
HSUPA Low Channel**



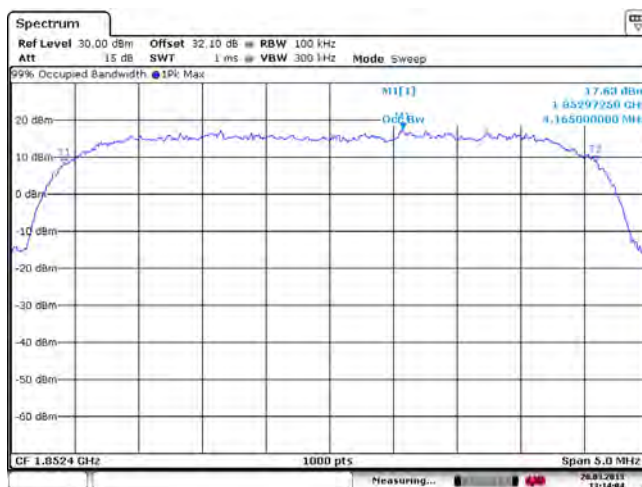
**Figure 2-45a: Occupied Bandwidth, Band 5
HSUPA Middle Channel**



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



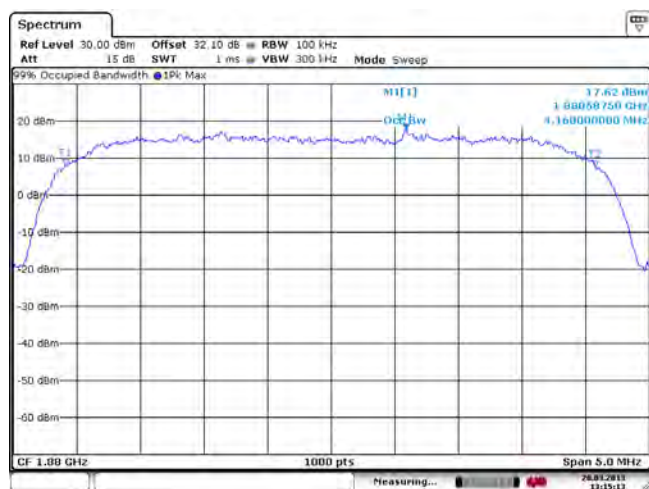
**Figure 2-47a: Occupied Bandwidth, Band 2
HSUPA Low Channel**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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

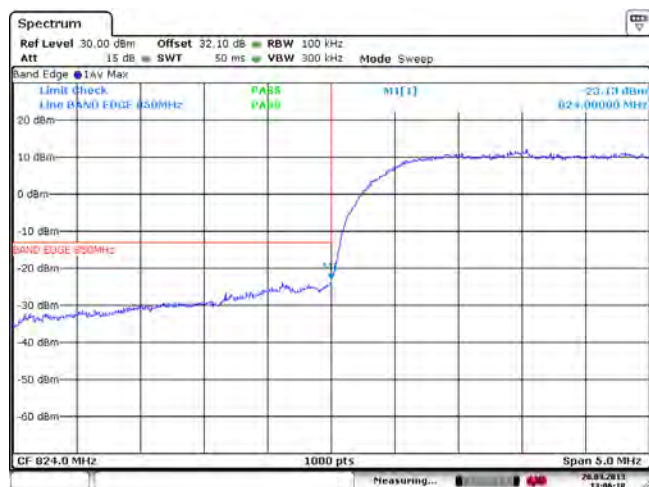
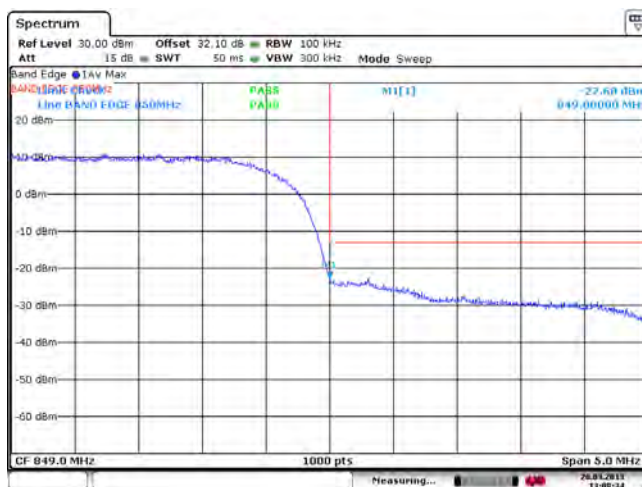


Figure 2-51a: Band 5 , HSUPA High Channel Mask



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

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

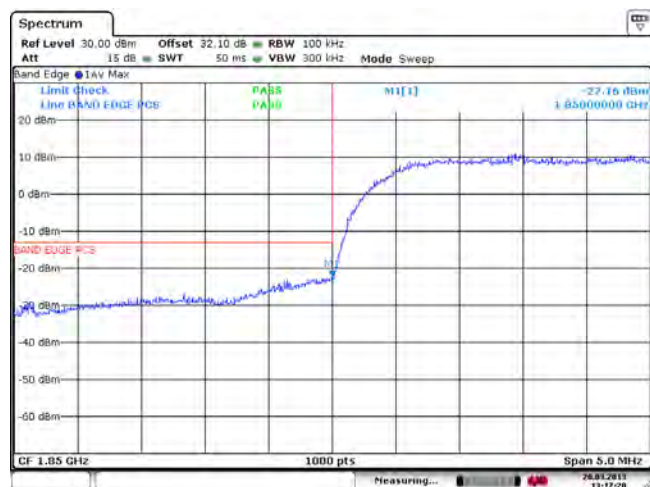
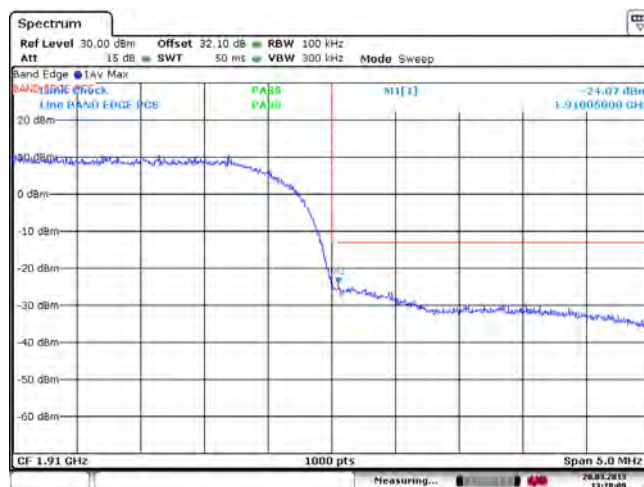


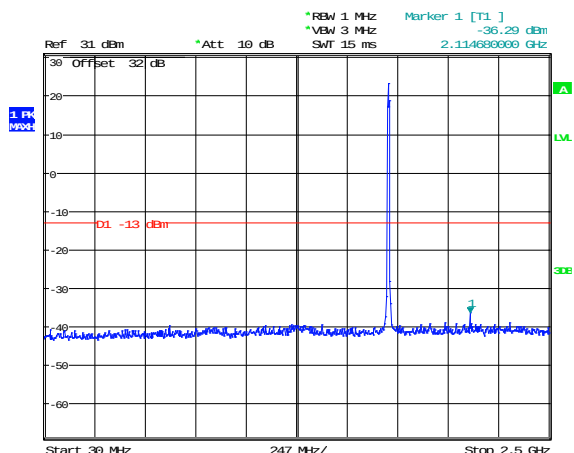
Figure 2-53a: Band 2, HSUPA High Channel Mask



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

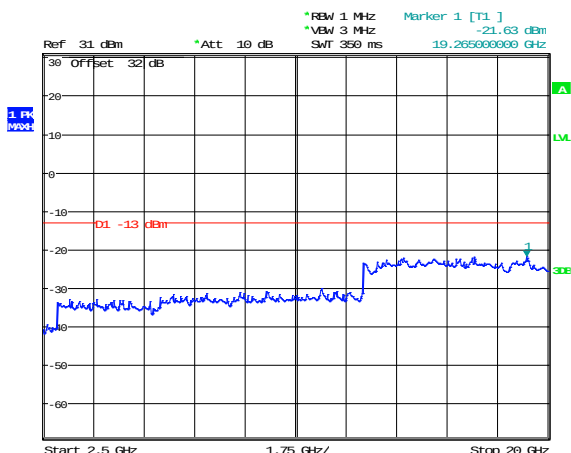
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-1b: Band 4, Spurious Conducted Emissions, Low channel



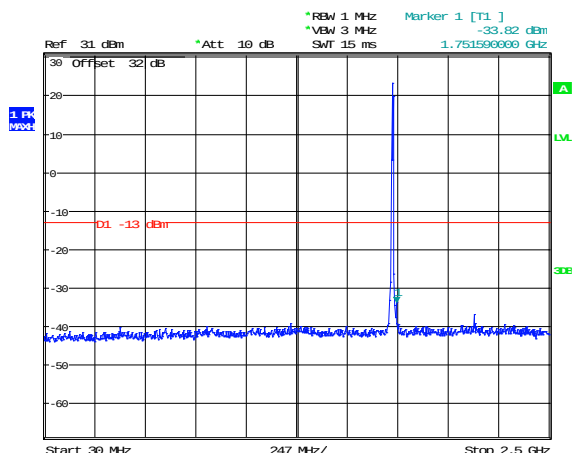
Date: 13.MAY.2013 11:33:22

Figure 2-2b: Band 4, Spurious Conducted Emissions, Low channel



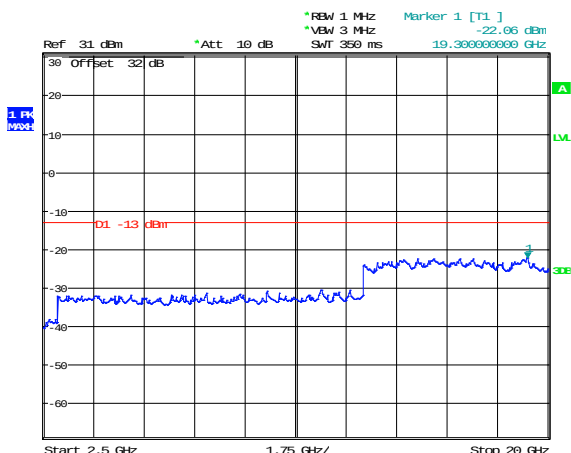
Date: 13.MAY.2013 11:47:19

Figure 2-3b: Band 4, Spurious Conducted Emissions, Middle channel



Date: 13.MAY.2013 11:34:15

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



Date: 13.MAY.2013 11:49:20

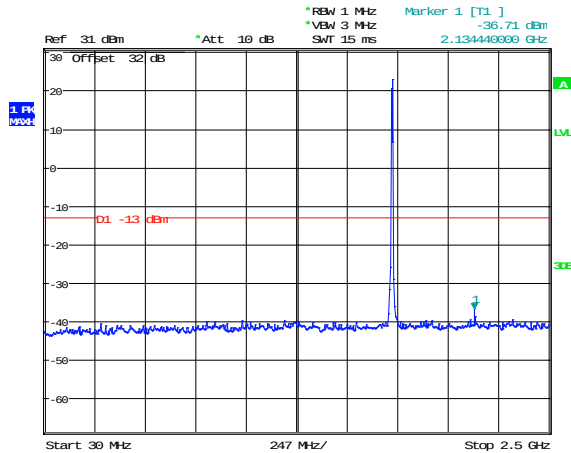
Test Report No.:
 RTS-6036-1303-30B

Dates of Test:
 February 26 to May 30, 2013

FCC ID: L6ARFS120LW **IC:** 2503A-RFS120LW
FCC ID: L6ARFR100LW **IC:** 2503A-RFR100LW

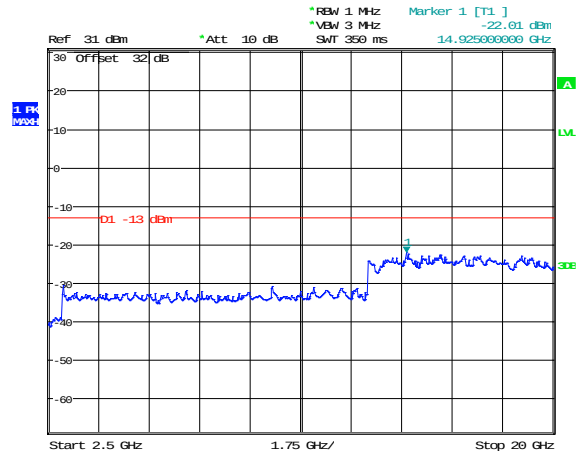
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-5b: Band 4, Spurious Conducted Emissions, High Channel



Date: 13.MAY.2013 11:45:23

Figure 2-6b: Band 4, Spurious Conducted Emissions, High Channel



Date: 13.MAY.2013 11:50:09

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

Figure 2-7b: Occupied Bandwidth, Band 4 Low Channel

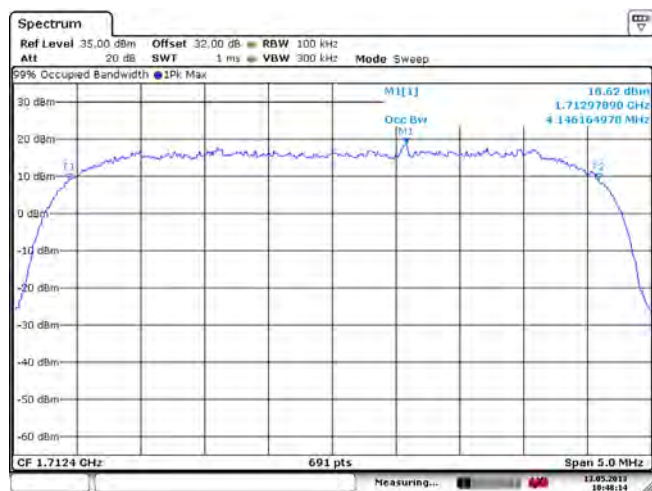


Figure 2-8b: Occupied Bandwidth, Band 4 Middle Channel

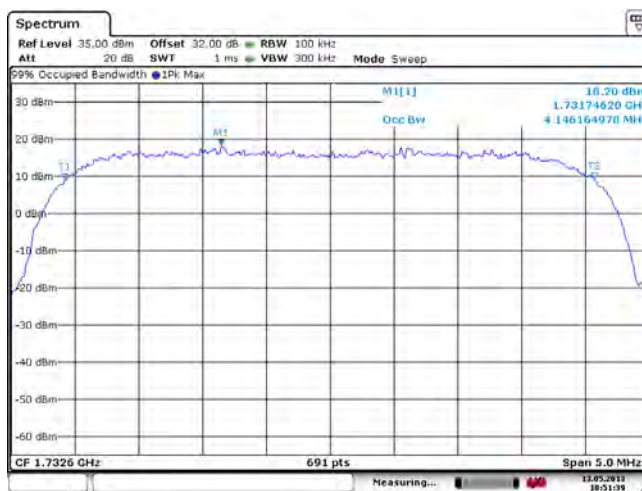


Figure 2-9b: Occupied Bandwidth, Band 4 High Channel

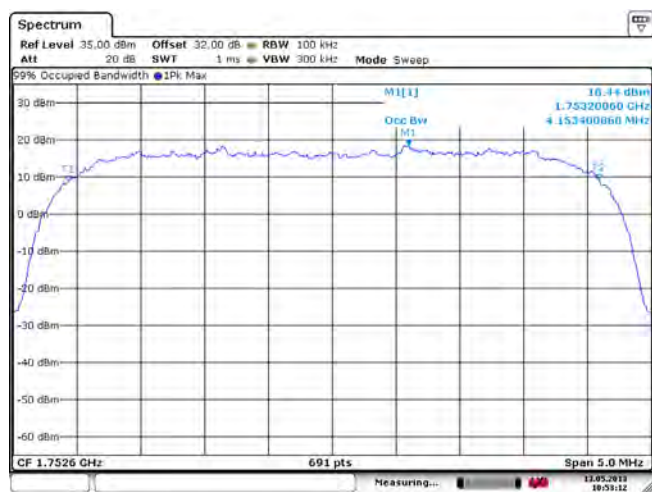
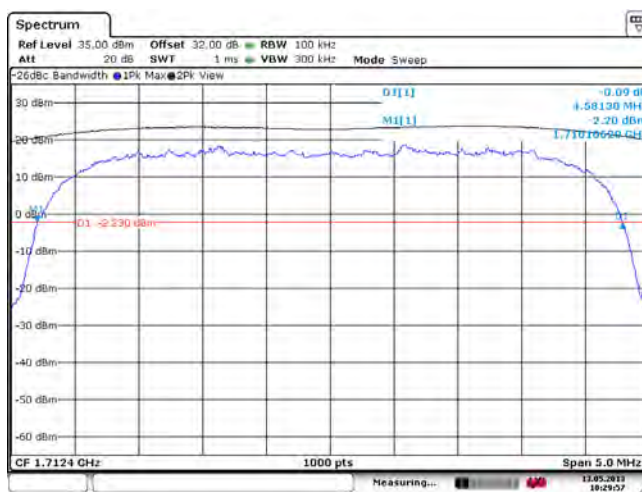


Figure 2-10b: -26 dBc Bandwidth, Band 4 Low Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Figure 2-11b: -26 dBc Bandwidth, Band 4 Middle Channel

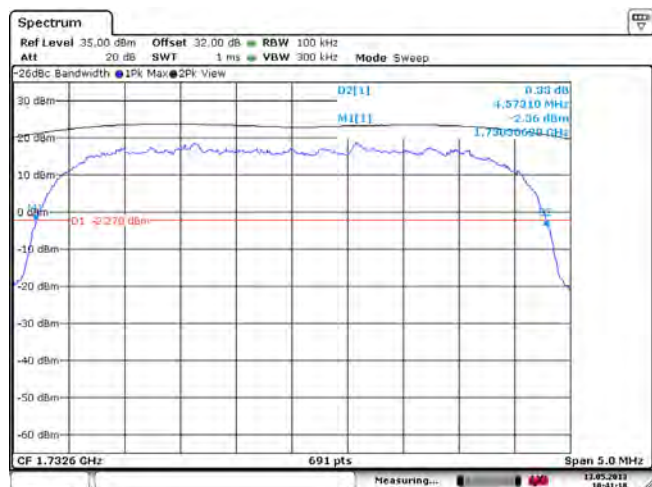


Figure 2-12b: -26 dBc Bandwidth, Band 4 High Channel

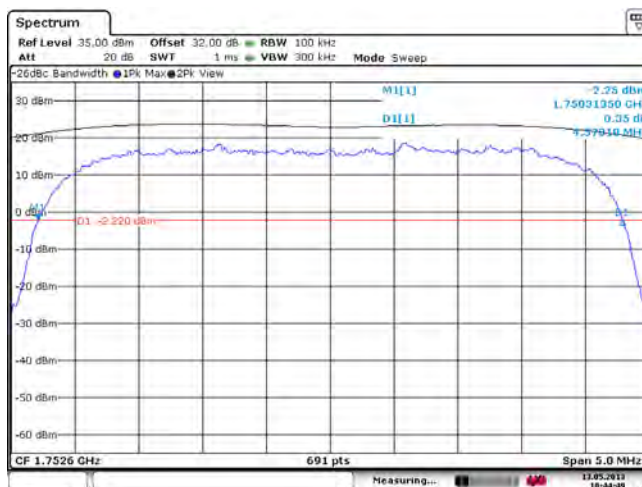


Figure 2-13b: Band 4 Low Channel Mask

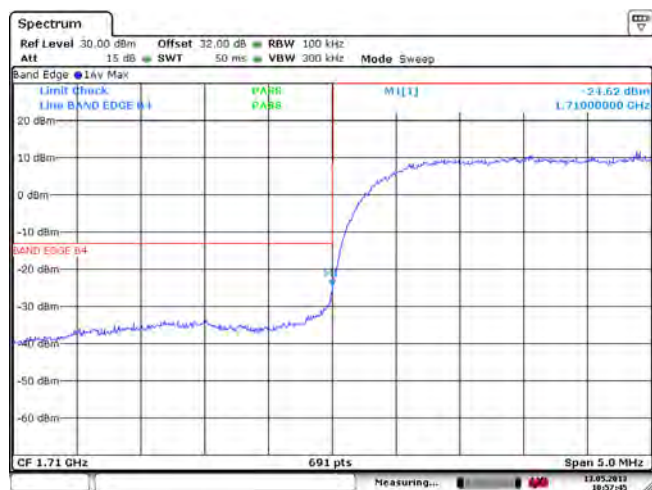
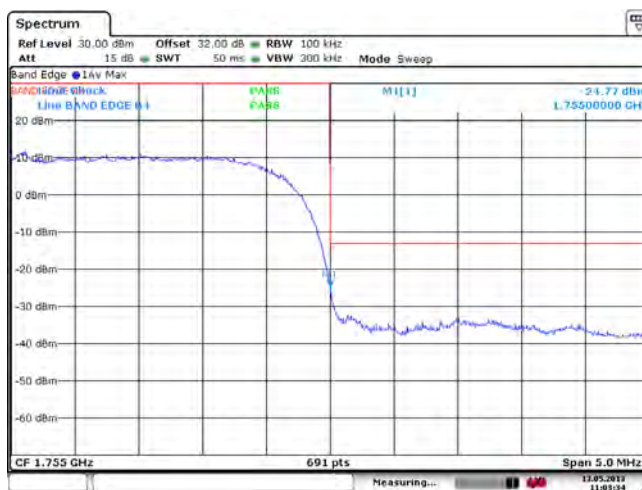


Figure 2-14b: Band 4 High Channel Mask



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

Figure 2-15b: Band 4, PAR Low Channel

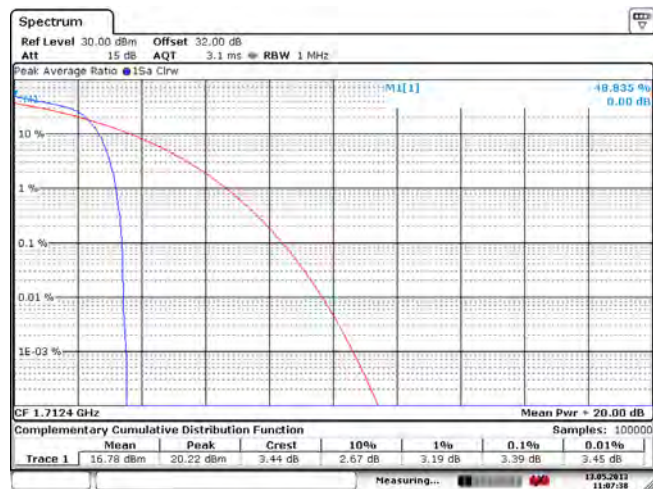


Figure 2-16b: Band 4, PAR Mid Channel

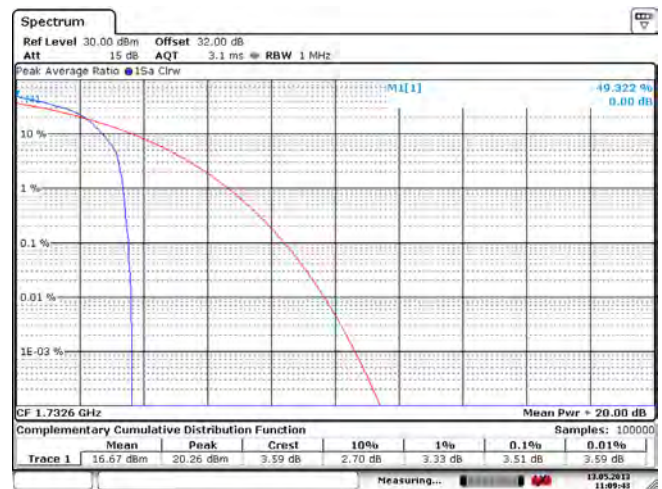
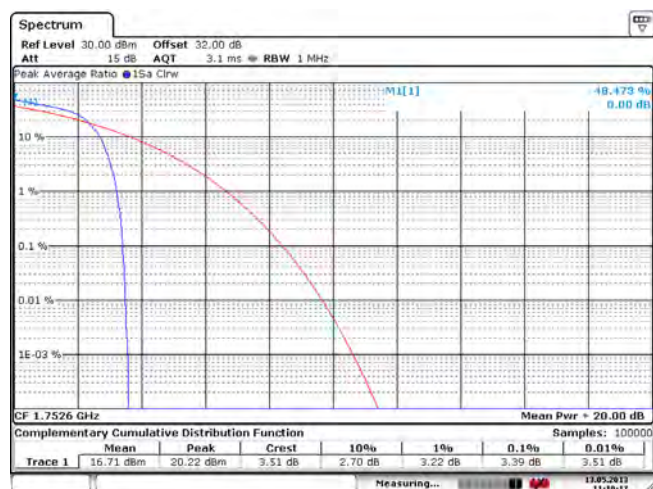


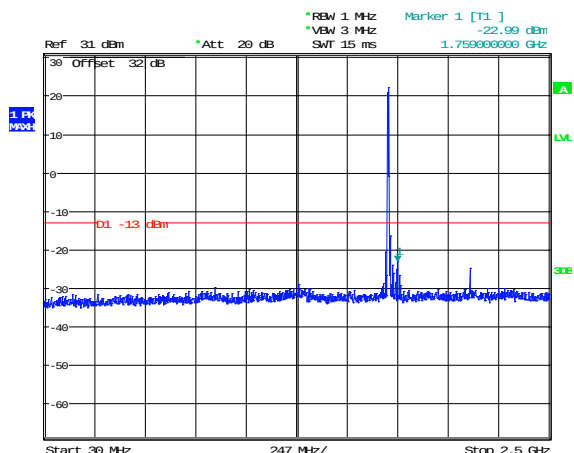
Figure 2-17b: Band 4, PAR High Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

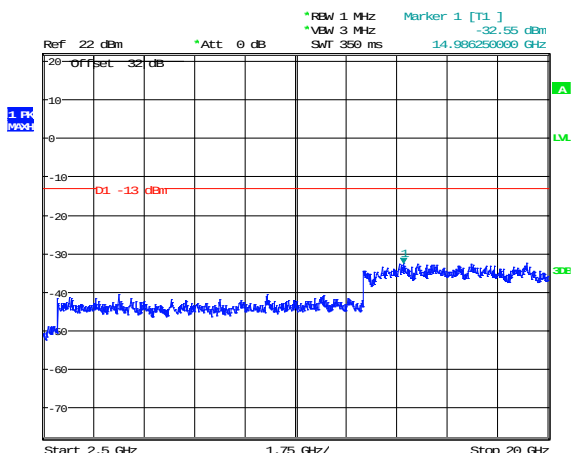
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-18b: Band 4 HSUPA, Spurious Conducted Emissions, Low channel



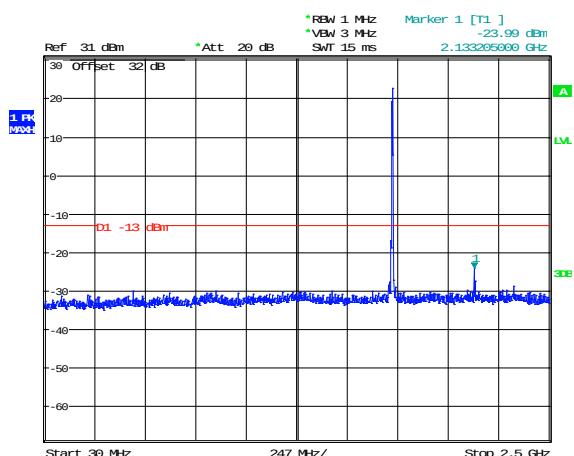
Date: 14.MAY.2013 10:48:48

Figure 2-19b: Band 4 HSUPA, Spurious Conducted Emissions, Low channel



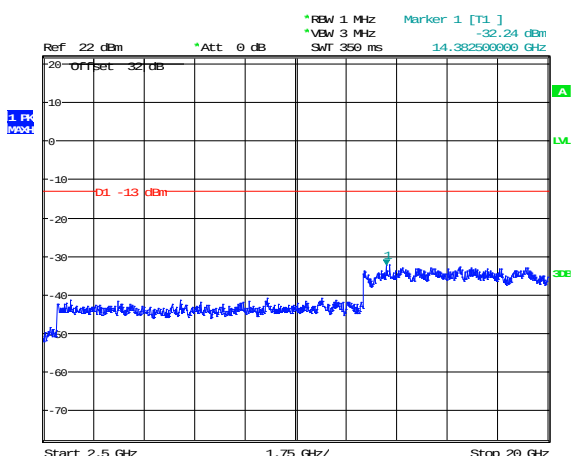
Date: 14.MAY.2013 10:52:52

Figure 2-20b: Band 4 HSUPA, Spurious Conducted Emissions, Middle channel



Date: 14.MAY.2013 10:49:49

Figure 2-21b: Band 4 HSUPA, Spurious Conducted Emissions, Middle channel

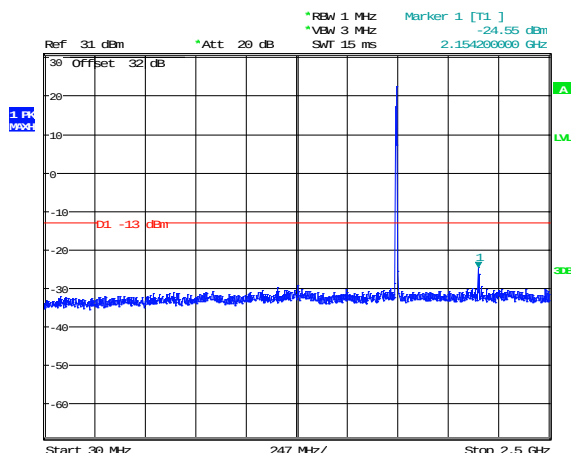


Date: 14.MAY.2013 10:52:18

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

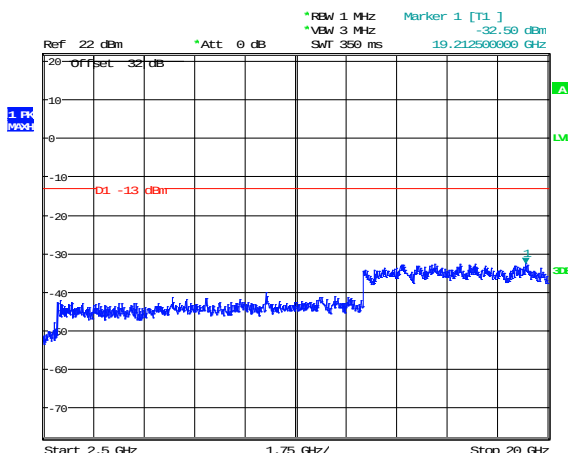
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-22b: Band 4 HSUPA, Spurious Conducted Emissions, High Channel



Date: 14.MAY.2013 10:50:43

Figure 2-23b: Band 4 HSUPA, Spurious Conducted Emissions, High Channel



Date: 14.MAY.2013 10:51:45

Figure 2-24b: Occupied Bandwidth, Band 4 HSUPA Low Channel

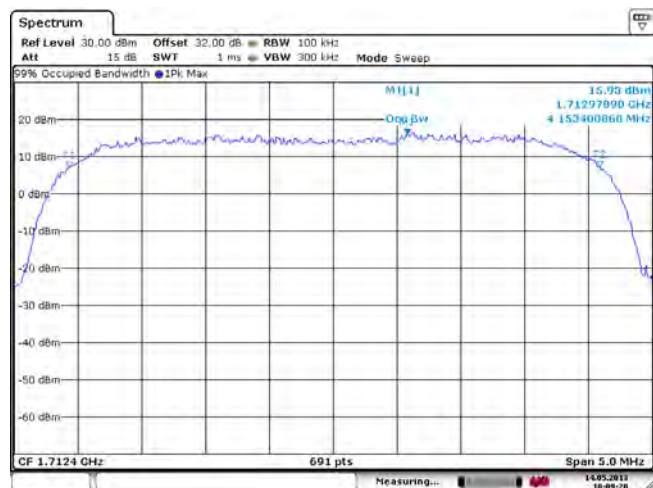
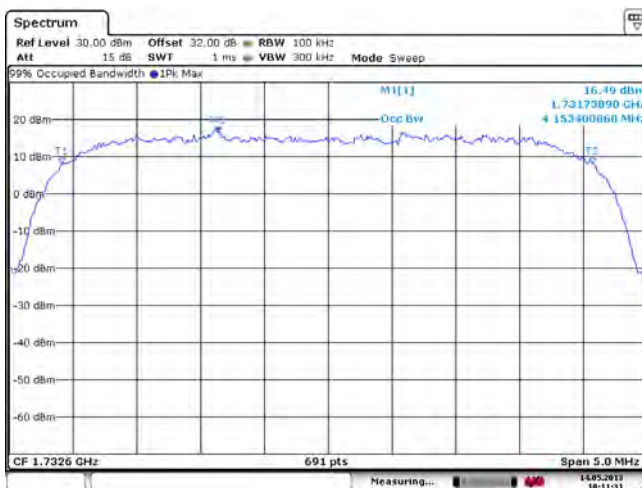


Figure 2-25b: Occupied Bandwidth, Band 4 HSUPA Middle Channel



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Conducted RF Emission Test Data cont'd

**Figure 2-26b: Occupied Bandwidth, Band 4
HSUPA High Channel**



Figure 2-27b: Band 4 , HSUPA Low Channel Mask

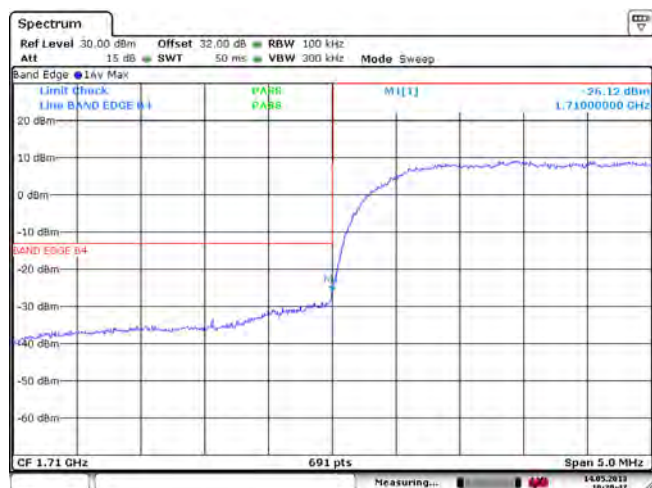
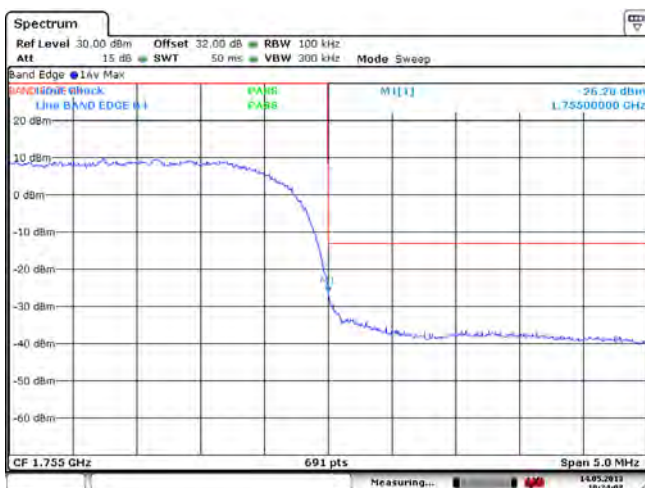


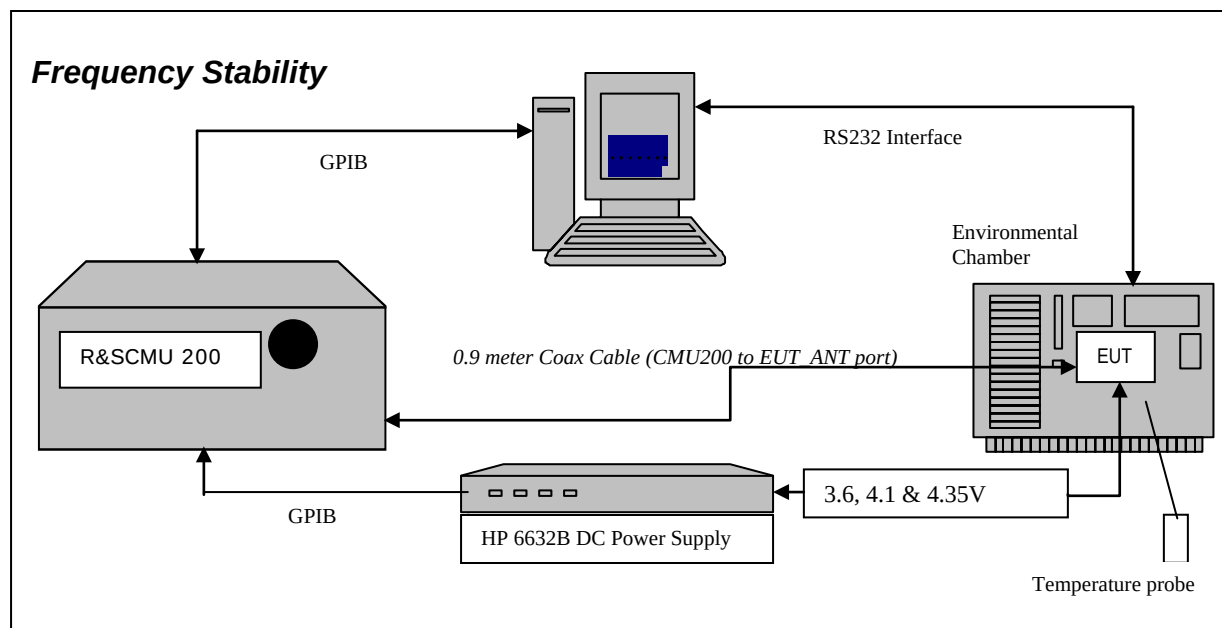
Figure 2-28b: Band 4 , HSUPA High Channel Mask



APPENDIX 2B – WCDMA Band 5/2/4 FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

WCDMA Frequency Stability Test Data



The following measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.1055 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation

(d) Frequency Stability - Voltage Variation

24.235 *Frequency Stability.*

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

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 27.54, CFR 47 and RSS-139, 6.3 Frequency Stability.

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

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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 frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 826.4, 836.4 and 846.6 MHz for the WCDMA Band 5. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.

The EUT 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.

The EUT frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 1712.4, 1732.6 and 1752.6 MHz for the WCDMA Band 4. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Procedure:

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

- Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
- Start test program
- Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
- Set power supply voltage to 3.6 volts.
- Set up CMU 200 Radio Communication Tester.
- Command the CMU 200 to switch to the low channel.
- Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
- EUT is commanded to Transmit 100 Bursts.
- 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.
- The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
- Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
- Increase temperature by 10°C and soak for 1/2 hour.
- Repeat steps 4 - 12 for temperatures –30°C to 60°C.
- 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 **0.0414 PPM**.
The maximum frequency error in the WCDMA band 2 measured was **-0.0084 PPM**.
The maximum frequency error in the WCDMA band 4 measured was **-0.0187PPM**.

EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW

IC: 2503A-RFS120LW
IC: 2503A-RER100LW

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW **IC:** 2503A-RFS120LW
FCC ID: L6ARFR100LW **IC:** 2503A-RFR100LW

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	-8.95	-0.0108
4132	826.4	3.6	-20	-1.06	-0.0013
4132	826.4	3.6	-10	12.07	0.0146
4132	826.4	3.6	0	-3.38	-0.0041
4132	826.4	3.6	10	-4.55	-0.0055
4132	826.4	3.6	20	21.80	0.0264
4132	826.4	3.6	30	-12.02	-0.0145
4132	826.4	3.6	40	19.64	0.0238
4132	826.4	3.6	50	21.06	0.0255
4132	826.4	3.6	60	-1.79	-0.0022
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.1	-30	18.78	0.0227
4132	826.4	4.1	-20	-2.44	-0.0030
4132	826.4	4.1	-10	-8.57	-0.0104
4132	826.4	4.1	0	-2.31	-0.0028
4132	826.4	4.1	10	20.63	0.0250
4132	826.4	4.1	20	-7.87	-0.0095
4132	826.4	4.1	30	-1.69	-0.0020
4132	826.4	4.1	40	0.62	0.0008
4132	826.4	4.1	50	-4.06	-0.0049
4132	826.4	4.1	60	26.54	0.0321
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.35	-30	-13.70	-0.0166
4132	826.4	4.35	-20	-5.70	-0.0069
4132	826.4	4.35	-10	-0.58	-0.0007
4132	826.4	4.35	0	-4.76	-0.0058
4132	826.4	4.35	10	20.67	0.0250
4132	826.4	4.35	20	-5.09	-0.0062
4132	826.4	4.35	30	10.02	0.0121
4132	826.4	4.35	40	17.62	0.0213
4132	826.4	4.35	50	23.60	0.0286
4132	826.4	4.35	60	-2.34	-0.0028

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	15.32	0.0183
4182	836.4	3.6	-20	18.93	0.0226
4182	836.4	3.6	-10	-5.78	-0.0069
4182	836.4	3.6	0	23.90	0.0286
4182	836.4	3.6	10	15.45	0.0185
4182	836.4	3.6	20	-4.04	-0.0048
4182	836.4	3.6	30	21.92	0.0262
4182	836.4	3.6	40	4.79	0.0057
4182	836.4	3.6	50	2.70	0.0032
4182	836.4	3.6	60	34.64	0.0414
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.1	-30	11.71	0.0140
4182	836.4	4.1	-20	-5.76	-0.0069
4182	836.4	4.1	-10	-4.82	-0.0058
4182	836.4	4.1	0	19.95	0.0239
4182	836.4	4.1	10	-5.39	-0.0064
4182	836.4	4.1	20	24.45	0.0292
4182	836.4	4.1	30	14.51	0.0173
4182	836.4	4.1	40	20.26	0.0242
4182	836.4	4.1	50	19.88	0.0238
4182	836.4	4.1	60	-7.18	-0.0086
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.35	-30	12.25	0.0146
4182	836.4	4.35	-20	13.73	0.0164
4182	836.4	4.35	-10	15.62	0.0187
4182	836.4	4.35	0	18.03	0.0216
4182	836.4	4.35	10	-6.01	-0.0072
4182	836.4	4.35	20	-9.05	-0.0108
4182	836.4	4.35	30	23.08	0.0276
4182	836.4	4.35	40	-1.70	-0.0020
4182	836.4	4.35	50	-3.17	-0.0038
4182	836.4	4.35	60	33.82	0.0404

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	15.36	0.0181
4233	846.6	3.6	-20	-4.05	-0.0048
4233	846.6	3.6	-10	-13.08	-0.0155
4233	846.6	3.6	0	18.25	0.0216
4233	846.6	3.6	10	-5.46	-0.0064
4233	846.6	3.6	20	-3.58	-0.0042
4233	846.6	3.6	30	13.63	0.0161
4233	846.6	3.6	40	18.20	0.0215
4233	846.6	3.6	50	24.96	0.0295
4233	846.6	3.6	60	-5.63	-0.0067
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.1	-30	18.53	0.0219
4233	846.6	4.1	-20	19.20	0.0227
4233	846.6	4.1	-10	20.86	0.0246
4233	846.6	4.1	0	23.27	0.0275
4233	846.6	4.1	10	17.10	0.0202
4233	846.6	4.1	20	-12.32	-0.0146
4233	846.6	4.1	30	-3.54	-0.0042
4233	846.6	4.1	40	-0.43	-0.0005
4233	846.6	4.1	50	-14.33	-0.0169
4233	846.6	4.1	60	-7.25	-0.0086
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.35	-30	-3.31	-0.0039
4233	846.6	4.35	-20	-4.07	-0.0048
4233	846.6	4.35	-10	16.31	0.0193
4233	846.6	4.35	0	20.88	0.0247
4233	846.6	4.35	10	19.85	0.0234
4233	846.6	4.35	20	-3.57	-0.0042
4233	846.6	4.35	30	17.83	0.0211
4233	846.6	4.35	40	-4.54	-0.0054
4233	846.6	4.35	50	-1.86	-0.0022
4233	846.6	4.35	60	-6.11	-0.0072

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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	-11.89	-0.0064
9400	1880.00	3.6	20	-10.85	-0.0058
9538	1907.60	3.6	20	-7.71	-0.0040

Traffic Channel Number	WCDMA1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.1	20	-8.95	-0.0048
9400	1880.00	4.1	20	-13.45	-0.0072
9538	1907.60	4.1	20	-6.60	-0.0035

Traffic Channel Number	WCDMA1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	20	-6.29	-0.0034
9400	1880.00	4.35	20	-5.44	-0.0029
9538	1907.60	4.35	20	-9.87	-0.0052

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-4.09	-0.0022
9262	1852.40	3.6	-20	-3.16	-0.0017
9262	1852.40	3.6	-10	-3.01	-0.0016
9262	1852.40	3.6	0	-2.00	-0.0011
9262	1852.40	3.6	10	-2.26	-0.0012
9262	1852.40	3.6	20	-11.89	-0.0064
9262	1852.40	3.6	30	-11.58	-0.0063
9262	1852.40	3.6	40	-11.11	-0.0060
9262	1852.40	3.6	50	-10.44	-0.0056
9262	1852.40	3.6	60	-11.20	-0.0060
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.1	-30	-0.21	-0.0001
9262	1852.40	4.1	-20	-3.25	-0.0018
9262	1852.40	4.1	-10	-2.87	-0.0015
9262	1852.40	4.1	0	-0.01	0.0000
9262	1852.40	4.1	10	-0.63	-0.0003
9262	1852.40	4.1	20	-8.95	-0.0048
9262	1852.40	4.1	30	-10.20	-0.0055
9262	1852.40	4.1	40	-10.75	-0.0058
9262	1852.40	4.1	50	-12.81	-0.0069
9262	1852.40	4.1	60	-7.81	-0.0042
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	-30	-3.01	-0.0016
9262	1852.40	4.35	-20	-3.86	-0.0021
9262	1852.40	4.35	-10	-1.61	-0.0009
9262	1852.40	4.35	0	-2.55	-0.0014
9262	1852.40	4.35	10	-0.54	-0.0003
9262	1852.40	4.35	20	-6.29	-0.0034
9262	1852.40	4.35	30	-6.99	-0.0038
9262	1852.40	4.35	40	-7.43	-0.0040
9262	1852.40	4.35	50	-7.37	-0.0040
9262	1852.40	4.35	60	-9.74	-0.0053

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-7.54	-0.0040
9400	1880.00	3.6	-20	-6.90	-0.0037
9400	1880.00	3.6	-10	-7.40	-0.0039
9400	1880.00	3.6	0	-8.57	-0.0046
9400	1880.00	3.6	10	-8.42	-0.0045
9400	1880.00	3.6	20	-10.85	-0.0058
9400	1880.00	3.6	30	-9.74	-0.0052
9400	1880.00	3.6	40	-13.98	-0.0074
9400	1880.00	3.6	50	-10.29	-0.0055
9400	1880.00	3.6	60	-9.39	-0.0050
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	4.1	-30	-5.56	-0.0030
9400	1880.00	4.1	-20	-6.21	-0.0033
9400	1880.00	4.1	-10	-4.87	-0.0026
9400	1880.00	4.1	0	-7.36	-0.0039
9400	1880.00	4.1	10	-8.43	-0.0045
9400	1880.00	4.1	20	-13.45	-0.0072
9400	1880.00	4.1	30	-10.00	-0.0053
9400	1880.00	4.1	40	-12.60	-0.0067
9400	1880.00	4.1	50	-10.66	-0.0057
9400	1880.00	4.1	60	-11.44	-0.0061
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	4.35	-30	-9.04	-0.0048
9400	1880.00	4.35	-20	-11.31	-0.0060
9400	1880.00	4.35	-10	-9.88	-0.0053
9400	1880.00	4.35	0	-8.79	-0.0047
9400	1880.00	4.35	10	-6.66	-0.0035
9400	1880.00	4.35	20	-5.44	-0.0029
9400	1880.00	4.35	30	-9.13	-0.0049
9400	1880.00	4.35	40	-8.81	-0.0047
9400	1880.00	4.35	50	-7.81	-0.0042
9400	1880.00	4.35	60	-6.13	-0.0033

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

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	-11.99	-0.0063
9538	1907.60	3.6	-20	-11.56	-0.0061
9538	1907.60	3.6	-10	-12.39	-0.0065
9538	1907.60	3.6	0	-9.62	-0.0050
9538	1907.60	3.6	10	-13.70	-0.0072
9538	1907.60	3.6	20	-7.71	-0.0040
9538	1907.60	3.6	30	-4.58	-0.0024
9538	1907.60	3.6	40	-5.88	-0.0031
9538	1907.60	3.6	50	-5.86	-0.0031
9538	1907.60	3.6	60	-4.68	-0.0025
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	4.1	-30	-16.00	-0.0084
9538	1907.60	4.1	-20	-12.21	-0.0064
9538	1907.60	4.1	-10	-15.53	-0.0081
9538	1907.60	4.1	0	-15.50	-0.0081
9538	1907.60	4.1	10	-12.78	-0.0067
9538	1907.60	4.1	20	-6.60	-0.0035
9538	1907.60	4.1	30	-8.87	-0.0046
9538	1907.60	4.1	40	-6.22	-0.0033
9538	1907.60	4.1	50	-7.62	-0.0040
9538	1907.60	4.1	60	-9.67	-0.0051
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	4.35	-30	-10.92	-0.0057
9538	1907.60	4.35	-20	-10.99	-0.0058
9538	1907.60	4.35	-10	-13.29	-0.0070
9538	1907.60	4.35	0	-14.71	-0.0077
9538	1907.60	4.35	10	-9.03	-0.0047
9538	1907.60	4.35	20	-9.87	-0.0052
9538	1907.60	4.35	30	-6.87	-0.0036
9538	1907.60	4.35	40	-7.01	-0.0037
9538	1907.60	4.35	50	-9.69	-0.0051
9538	1907.60	4.35	60	-6.35	-0.0033

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 2B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

The following measurements were performed on product RFS121LW.

Date of Test: May 13, 2013

The environmental conditions were: Temperature: 25 °C
 Humidity: 29 %

WCDMA Band 4 results: channels 1312, 1413 and 1513 @ 20°C maximum transmitted power

Traffic Channel Number	WCDMA Band 4 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	3.6	20	-30.80	-0.0180
1413	1732.6	3.6	20	12.91	0.0075
1513	1752.6	3.6	20	31.83	0.0210

Traffic Channel Number	WCDMA Band 4 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	4.1	20	-30.88	-0.0180
1413	1732.6	4.1	20	13.33	0.0077
1513	1752.6	4.1	20	26.13	0.0173

Traffic Channel Number	WCDMA Band 4 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	4.35	20	-31.14	-0.0182
1413	1732.6	4.35	20	10.99	0.0063
1513	1752.6	4.35	20	29.86	0.0197

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

WCDMA Band 4 Results: channel 1312 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312.00	1712.40	3.6	-30	-8.00	-0.0047
1312.00	1712.40	3.6	-20	-8.20	-0.0048
1312.00	1712.40	3.6	-10	-5.76	-0.0034
1312.00	1712.40	3.6	0	-32.00	-0.0187
1312.00	1712.40	3.6	10	-30.07	-0.0176
1312.00	1712.40	3.6	20	-30.80	-0.0180
1312.00	1712.40	3.6	30	-30.51	-0.0178
1312.00	1712.40	3.6	40	12.00	0.0070
1312.00	1712.40	3.6	50	14.21	0.0083
1312.00	1712.40	3.6	60	10.00	0.0058
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312.00	1712.40	4.1	-30	-7.00	-0.0041
1312.00	1712.40	4.1	-20	-4.80	-0.0028
1312.00	1712.40	4.1	-10	-4.59	-0.0027
1312.00	1712.40	4.1	0	-32.00	-0.0187
1312.00	1712.40	4.1	10	-30.41	-0.0178
1312.00	1712.40	4.1	20	-30.88	-0.0180
1312.00	1712.40	4.1	30	-31.50	-0.0184
1312.00	1712.40	4.1	40	8.71	0.0051
1312.00	1712.40	4.1	50	11.27	0.0066
1312.00	1712.40	4.1	60	8.00	0.0047
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312.00	1712.40	4.35	-30	-7.00	-0.0041
1312.00	1712.40	4.35	-20	-5.00	-0.0029
1312.00	1712.40	4.35	-10	-6.86	-0.0040
1312.00	1712.40	4.35	0	-33.00	-0.0193
1312.00	1712.40	4.35	10	-30.31	-0.0177
1312.00	1712.40	4.35	20	-31.14	-0.0182
1312.00	1712.40	4.35	30	-30.63	-0.0179
1312.00	1712.40	4.35	40	9.72	0.0057
1312.00	1712.40	4.35	50	12.91	0.0075
1312.00	1712.40	4.35	60	10.00	0.0058

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

WCDMA Band 4 Results: channel 1413 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1413.00	1732.60	3.6	-30	10.00	0.0058
1413.00	1732.60	3.6	-20	12.04	0.0069
1413.00	1732.60	3.6	-10	11.71	0.0068
1413.00	1732.60	3.6	0	10.00	0.0058
1413.00	1732.60	3.6	10	10.62	0.0061
1413.00	1732.60	3.6	20	12.91	0.0075
1413.00	1732.60	3.6	30	12.11	0.0070
1413.00	1732.60	3.6	40	12.73	0.0073
1413.00	1732.60	3.6	50	12.94	0.0075
1413.00	1732.60	3.6	60	10.00	0.0058
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1413.00	1732.60	4.1	-30	10.00	0.0058
1413.00	1732.60	4.1	-20	12.09	0.0070
1413.00	1732.60	4.1	-10	11.55	0.0067
1413.00	1732.60	4.1	0	11.00	0.0063
1413.00	1732.60	4.1	10	11.01	0.0064
1413.00	1732.60	4.1	20	13.33	0.0077
1413.00	1732.60	4.1	30	11.25	0.0065
1413.00	1732.60	4.1	40	12.81	0.0074
1413.00	1732.60	4.1	50	10.96	0.0063
1413.00	1732.60	4.1	60	11.00	0.0063
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1413.00	1732.60	4.35	-30	10.00	0.0058
1413.00	1732.60	4.35	-20	10.35	0.0060
1413.00	1732.60	4.35	-10	10.03	0.0058
1413.00	1732.60	4.35	0	11.00	0.0063
1413.00	1732.60	4.35	10	12.99	0.0075
1413.00	1732.60	4.35	20	10.99	0.0063
1413.00	1732.60	4.35	30	13.09	0.0076
1413.00	1732.60	4.35	40	11.59	0.0067
1413.00	1732.60	4.35	50	12.22	0.0071
1413.00	1732.60	4.35	60	11.00	0.0063

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

WCDMA Band 4 Results: channel 1513 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1513.00	1752.6	3.6	-30	-9.00	-0.0051
1513.00	1752.6	3.6	-20	-10.05	-0.0057
1513.00	1752.6	3.6	-10	-8.31	-0.0047
1513.00	1752.6	3.6	0	28.00	0.0160
1513.00	1752.6	3.6	10	29.11	0.0166
1513.00	1752.6	3.6	20	31.83	0.0182
1513.00	1752.6	3.6	30	29.59	0.0169
1513.00	1752.6	3.6	40	-14.39	-0.0082
1513.00	1752.6	3.6	50	-10.99	-0.0063
1513.00	1752.6	3.6	60	-15.00	-0.0086
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1513.00	1752.6	4.1	-30	-10.00	-0.0057
1513.00	1752.6	4.1	-20	-9.23	-0.0053
1513.00	1752.6	4.1	-10	-6.86	-0.0039
1513.00	1752.6	4.1	0	26.00	0.0148
1513.00	1752.6	4.1	10	26.93	0.0154
1513.00	1752.6	4.1	20	26.13	0.0149
1513.00	1752.6	4.1	30	28.39	0.0162
1513.00	1752.6	4.1	40	-16.43	-0.0094
1513.00	1752.6	4.1	50	-16.29	-0.0093
1513.00	1752.6	4.1	60	-17.00	-0.0097
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1513.00	1752.6	4.35	-30	-11.00	-0.0063
1513.00	1752.6	4.35	-20	-9.54	-0.0054
1513.00	1752.6	4.35	-10	-7.87	-0.0045
1513.00	1752.6	4.35	0	28.00	0.0160
1513.00	1752.6	4.35	10	30.72	0.0175
1513.00	1752.6	4.35	20	29.86	0.0170
1513.00	1752.6	4.35	30	29.78	0.0170
1513.00	1752.6	4.35	40	-14.06	-0.0080
1513.00	1752.6	4.35	50	-14.19	-0.0081
1513.00	1752.6	4.35	60	-15.00	-0.0086

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C		
Test Report No.: RTS-6036-1303-30B	Dates of Test: March 11 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

APPENDIX 2C – WCDMA Band 5/2/4 RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C			
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW	

Radiated Power Test Data Results

The following measurements were performed on product RFS121LW.

Date of Test: March 08, 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)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	4132	826.40	5	Dipole	V	-39.90	-29.78	V-V	5.49	23.39	0.22	38.5	-15.11
F0	4132	826.40	5	Dipole	H	-29.78		H-H	6.28				
F0	4182	836.40	5	Dipole	V	-40.40	-29.84	V-V	5.94	23.31	0.21	38.5	-15.19
F0	4182	836.40	5	Dipole	H	-29.84		H-H	6.50				
F0	4233	846.60	5	Dipole	V	-40.06	-30.15	V-V	5.14	24.42	0.28	38.5	-14.08
F0	4233	846.60	5	Dipole	H	-30.15		H-H	7.60				

WCDMA Band 5 HSUPA Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
		(MHz)				(dBuV)	(dBm)			Tx-Rx	(dBm)		
F0	4132	826.40	5	Dipole	V	-41.61	-31.37	V-V	3.98	21.85	0.15	38.50	-16.65
F0	4132	826.40	5	Dipole	H	-31.37		H-H	4.74				
F0	4182	836.40	5	Dipole	V	-42.09	-31.69	V-V	4.16	21.56	0.14	38.50	-16.94
F0	4182	836.40	5	Dipole	H	-31.69		H-H	4.75				
F0	4233	846.60	5	Dipole	V	-41.63	-31.61	V-V	3.66	22.87	0.19	38.50	-15.63
F0	4233	846.60	5	Dipole	H	-31.61		H-H	6.05				

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Power Test Data Results cont'd

Date of Test: March 25, 2013

The following measurements were performed by Feras Obeid.

The environmental test 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 2 Call Service Mode

EUT								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
		Frequency				Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Isotropic radiator)		Limit	Diff to Limit
Type	Ch	(MHz)	Band	Type	Pol.	(dBm)	(dBm)	Tx-Rx	(dBm)	(dBm)	(W)		
F0	9262	1852.40	2	Horn	V	-29.65	-25.89	V-V	-15.50	23.97	0.25	33.0	-9.03
F0	9262	1852.40	2	Horn	H	-25.89		H-H	-15.37				
F0	9400	1880.00	2	Horn	V	-30.34	-26.78	V-V	-16.04	23.30	0.21	33.0	-9.70
F0	9400	1880.00	2	Horn	H	-26.78		H-H	-15.69				
F0	9538	1907.60	2	Horn	V	-30.56	-26.95	V-V	-16.71	23.13	0.21	33.0	-9.87
F0	9538	1907.60	2	Horn	H	-26.95		H-H	-15.75				

WCDMA Band 2 HSUPA Mode

EUT								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBm)	Pol.	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	9262	1852.40	2	Horn	V	-31.58	-27.59	V-V	-17.19	22.37	0.17	33.0	-10.63
F0	9262	1852.40	2	Horn	H	-27.59		H-H	-16.97				
F0	9400	1880.00	2	Horn	V	-31.71	-28.20	V-V	-17.56	21.92	0.16	33.0	-11.08
F0	9400	1880.00	2	Horn	H	-28.20		H-H	-17.07				
F0	9538	1907.60	2	Horn	V	-32.03	-28.21	V-V	-17.97	21.78	0.15	33.0	-11.22
F0	9538	1907.60	2	Horn	H	-28.21		H-H	-17.10				

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results cont'd

WCDMA Band 2 Call Service mode

Date of Test: February 25, 2013

The following measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 25 °C
 Relative Humidity: 17.8 %

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.

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 and 9538.

All emissions were at least 25.0 dB below the limit.

Date of Test: March 08 - 26, 2013

The following measurements were performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 23.2 - 25.6 °C
 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 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, 9538.

All emissions were at least 25.0 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results cont'd

WCDMA Band 2 HSUPA Mode

Date of Test: February 25, 2013

The environmental test conditions were: Temperature: 25 °C
 Relative Humidity: 17.8 %

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.

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, and 9538.

All emissions were at least 25.0 dB below the limit.

Date of Test: March 08 - 26, 2013

The following measurements were performed by Mahmood Ahmed
The environmental test conditions were: Temperature: 23.2 - 25.6 °C
 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 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, 9538.

All emissions were at least 25.0 dB below the limit.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C			
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW	

Radiated Emissions Test Data Results cont'd

The following measurements were performed on product RFS121LW.

Date of Test: April 01, 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)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	4132	826.40	5	Dipole	V	-38.85	-29.46	V-V	5.24	22.35	0.17	38.5	-16.15
F0	4132	826.40	5	Dipole	H	-29.46		H-H	3.32				
F0	4182	836.40	5	Dipole	V	-39.78	-29.57	V-V	5.95	22.76	0.19	38.5	-15.74
F0	4182	836.40	5	Dipole	H	-29.57		H-H	4.42				
F0	4233	846.60	5	Dipole	V	-39.18	-30.00	V-V	6.12	22.94	0.20	38.5	-15.56
F0	4233	846.60	5	Dipole	H	-30.00		H-H	4.30				

WCDMA Band 5 HSUPA Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
		Frequency				Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Dipole)			
Type	Ch	(MHz)	Band	Type	Pol.	(dBm)	(dBm)	Tx-Rx	(dBm)	(dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	4132	826.40	5	Dipole	V	-40.53	-31.07	V-V	3.67	20.78	0.12	38.50	-17.72
F0	4132	826.40	5	Dipole	H	-31.07		H-H	1.74				
F0	4182	836.40	5	Dipole	V	-41.58	-31.21	V-V	4.25	21.06	0.13	38.50	-17.44
F0	4182	836.40	5	Dipole	H	-31.21		H-H	2.71				
F0	4233	846.60	5	Dipole	V	-40.94	-31.60	V-V	4.54	21.36	0.14	38.50	-17.14
F0	4233	846.60	5	Dipole	H	-31.60		H-H	2.61				

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Power Test Data Results cont'd

Date of Test: March 08, 2013

The following measurements were performed by Feras Obeid.

The environmental test 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 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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	9262	1852.40	2	Horn	V	-28.86	-25.28	V-V	-15.44	24.43	0.28	33.0	-8.57
F0	9262	1852.40	2	Horn	H	-25.28		H-H	-14.91				
F0	9400	1880.00	2	Horn	V	-29.03	-25.37	V-V	-15.10	24.46	0.28	33.0	-8.54
F0	9400	1880.00	2	Horn	H	-25.37		H-H	-14.53				
F0	9538	1907.60	2	Horn	V	-30.21	-25.87	V-V	-15.93	23.63	0.23	33.0	-9.37
F0	9538	1907.60	2	Horn	H	-25.87		H-H	-15.25				

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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	9262	1852.40	2	Horn	V	-30.73	-26.23	V-V	-16.43	23.48	0.22	33.0	-9.52
F0	9262	1852.40	2	Horn	H	-26.23		H-H	-15.86				
F0	9400	1880.00	2	Horn	V	-30.58	-27.32	V-V	-17.50	22.48	0.18	33.0	-10.52
F0	9400	1880.00	2	Horn	H	-27.32		H-H	-16.51				
F0	9538	1907.60	2	Horn	V	-31.58	-27.73	V-V	-17.83	21.72	0.15	33.0	-11.28
F0	9538	1907.60	2	Horn	H	-27.73		H-H	-17.16				

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 2C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Power Test Data Results

The following measurements were performed on product RFR101LW.

Date of Test: May 14, 2013

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 23.2 °C
Relative Humidity: 30.0 %

The BlackBerry® smartphone was standalone, USB down with LCD facing 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 4 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)		Limit (dBm)	Diff. To Limit (dB)
											(dBm)		
F0	1312	1712.40	4	Horn	V	-26.27	-26.27	V-V	-18.77	21.13	0.13	30.00	8.87
F0	1312	1712.40	4	Horn	H	-29.18		H-H	-18.42				
F0	1413	1732.60	4	Horn	V	-24.44	-24.44	V-V	-16.97	23.16	0.21	30.00	6.84
F0	1413	1732.60	4	Horn	H	-28.09		H-H	-16.51				
F0	1513	1752.60	4	Horn	V	-25.16	-25.16	V-V	-17.26	22.62	0.18	30.00	7.38
F0	1513	1752.60	4	Horn	H	-28.60		H-H	-16.79				

WCDMA Band 4 HSUPA Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
		(MHz)				(dBuV)	(dBm)			Tx-Rx	(dBm)		
F0	1312	1712.40	4	Horn	V	-27.68	-27.68	V-V	-20.00	19.56	0.09	30.00	10.44
F0	1312	1712.40	4	Horn	H	-30.59		H-H	-19.99				
F0	1413	1732.60	4	Horn	V	-26.02	-26.02	V-V	-18.57	21.54	0.14	30.00	8.46
F0	1413	1732.60	4	Horn	H	-29.71		H-H	-18.13				
F0	1513	1752.60	4	Horn	V	-26.78	-26.78	V-V	-18.85	21.00	0.13	30.00	9.00
F0	1513	1752.60	4	Horn	H	-30.17		H-H	-18.41				

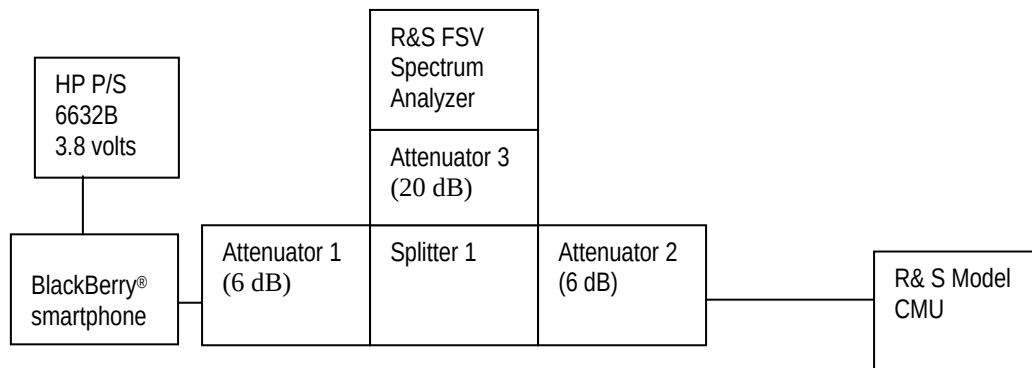
APPENDIX 3A – LTE Band 2 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: May 14 and May 23, 2013

The environmental test conditions were: Temperature: 24.3°C
 Relative Humidity: 19.5 %

The following measurements were performed by Berkin Can.

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Emission Designator Table

LTE Band 2 Frequency (MHz)	Conducted Output Power (dBm)	RB Size	RB Offset	Emission Designator	RB Size	RB Offset	Band	Bandwidth (MHz)	Modulation
1880	22.85	1	3	1M09G7D	6	0	LTE B2	1.4	QPSK
1909.3	21.73	1	5	1M09D7W	6	0	LTE B2	1.4	16QAM
1908.5	22.83	1	14	2M68G7D	15	0	LTE B2	3	QPSK
1908.5	21.72	1	14	2M68D7W	15	0	LTE B2	3	16QAM
1880	22.85	1	13	4M47G7D	25	0	LTE B2	5	QPSK
1852.5	22.13	1	0	4M47D7W	25	0	LTE B2	5	16QAM
1855	22.77	1	0	8M92G7D	50	0	LTE B2	10	QPSK
1880	21.59	1	25	8M44D7W	50	0	LTE B2	10	16QAM
1902.5	22.82	1	74	13M4G7D	75	0	LTE B2	15	QPSK
1902.5	21.75	1	74	13M4D7W	75	0	LTE B2	15	16QAM
1860	22.77	1	0	17M9G7D	100	0	LTE B2	20	QPSK
1900	22.83	1	99	17M9D7W	100	0	LTE B2	20	16QAM

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.232(d), CFR 2.202, RSS - 133 were measured from 30 MHz to 20 GHz.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz with different number of resource blocks as per scalable bandwidths for LTE Band 2, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.

QPSK and 16-QAM modulations were applied to each of the bandwidths. Only the worst case measurements are documented in this report.

A minimum resource block condition was also measured (RB = 1).

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 LTE Band 2 was measured to be 18.669 MHz as shown below. Results were derived in a 200 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Data for LTE Band 2 selected Frequencies in 20MHz bandwidth (RB = 100)

LTE Band 2 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	QPSK	16QAM
1860.000	18.669	17.858	17.829
1880.000	18.582	17.829	17.858
1900.000	18.524	17.8	17.858

Peak to Average Ratio (PAR)

For each 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20 MHz with different number of resource blocks as per scalable bandwidths for LTE Band 2, the peak to average ratio was measured on the low, middle and high channels with QPSK and 16-QAM modulation. 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 9.97 dB on middle channel in 20MHz bandwidth with 50 resource blocks.

Measurement Plots for LTE Band 2

Refer to the following measurement plots for more detail:

The following measurements were done on product RFR101LW:

See Figures 3-1a to 3-18a for the plots of the conducted spurious emissions.

See Figures 3-19a to 3-24a and 3-43a to 3-45a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

See Figures 3-25a to 3-36a for the plots of the Channel mask.

See Figures 3-37a to 3-42a for the plots of the Peak to Average Ratio.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
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LTE Band 2 Conducted RF Emission Test Data (cont'd)

Figure 3-1a: Band 2, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 100)

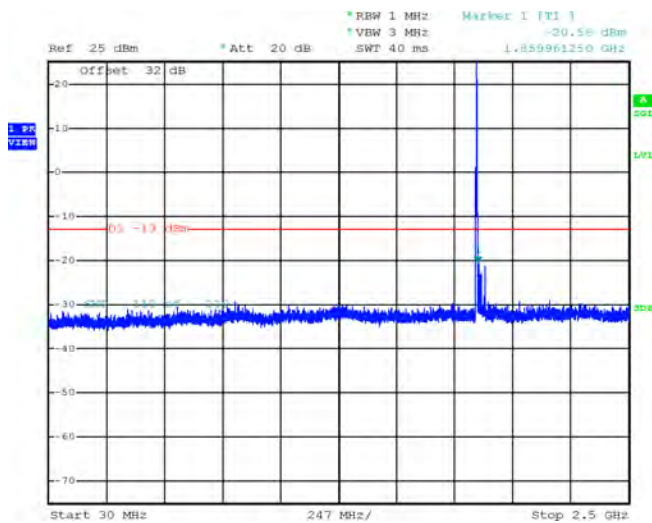


Figure 3-2a: Band 2, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 100)

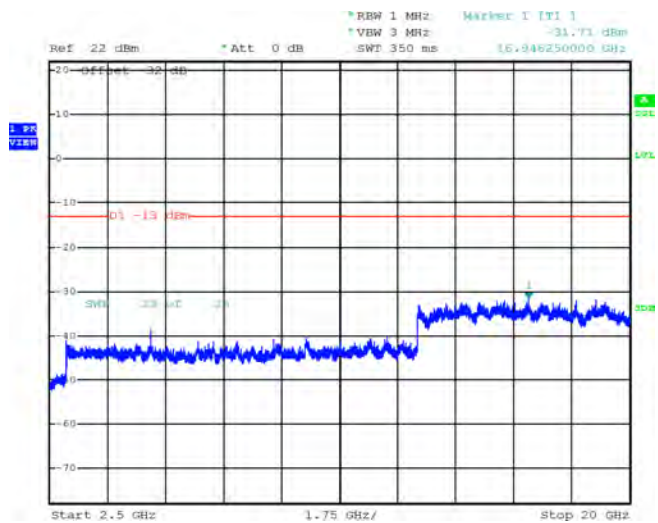


Figure 3-3a: Band 2, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 100)

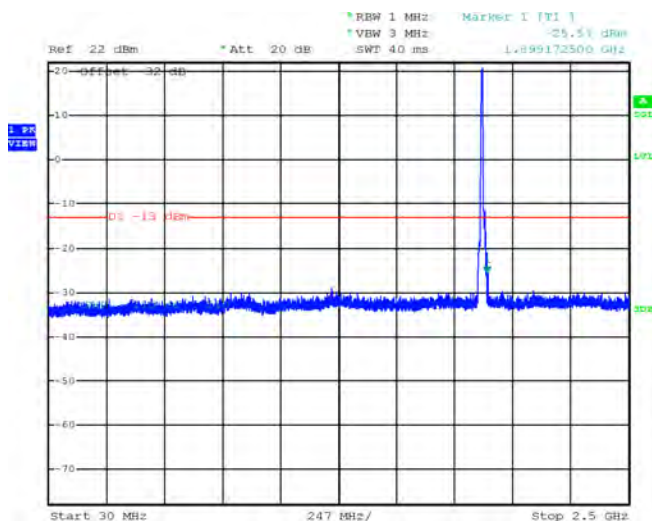
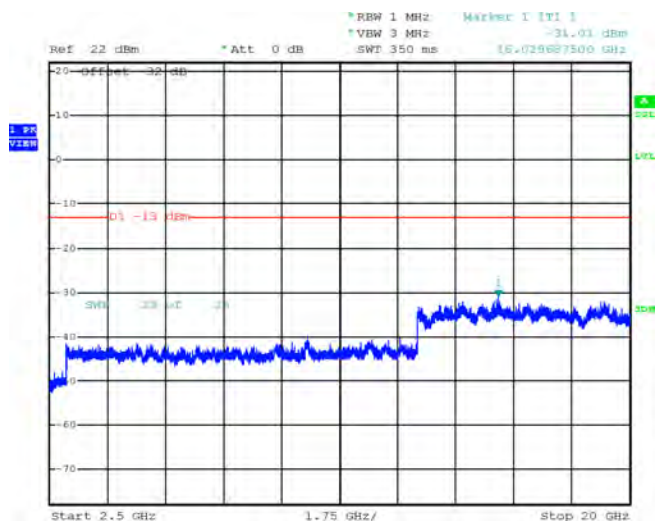


Figure 3-4a: Band 2, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 100)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-5a: Band 2, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)

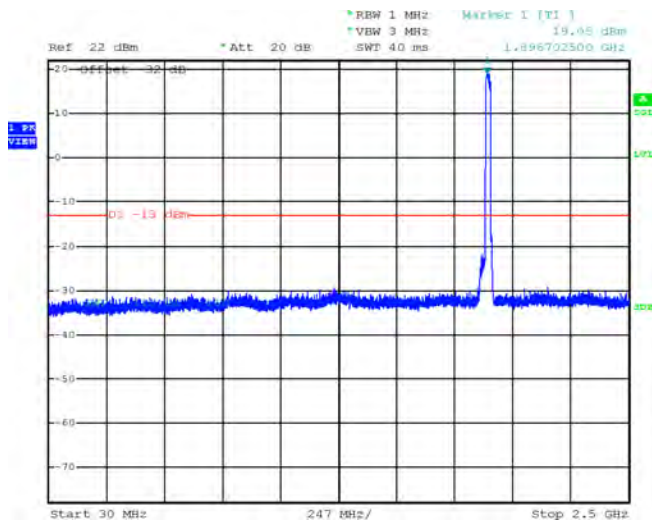


Figure 3-6a: Band 2, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)

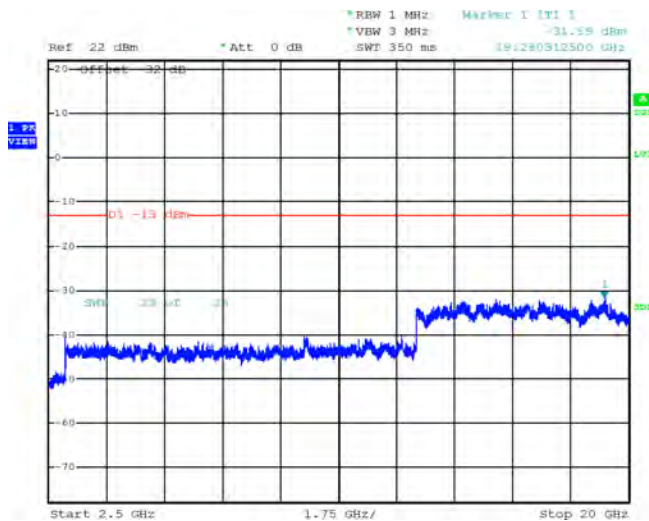


Figure 3-7a: Band 2, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 50)

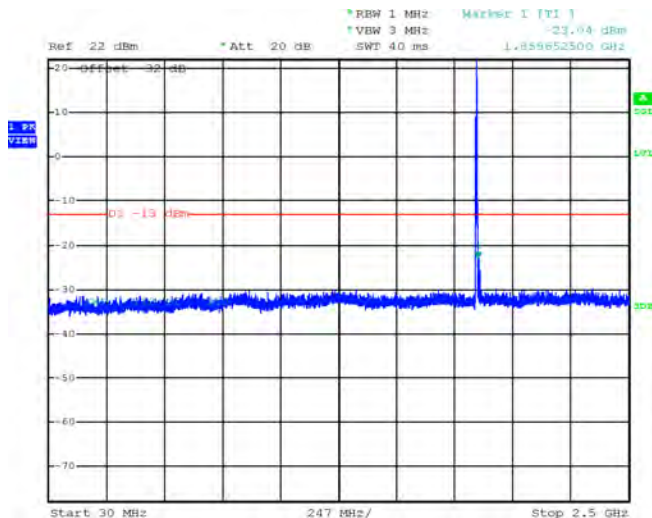
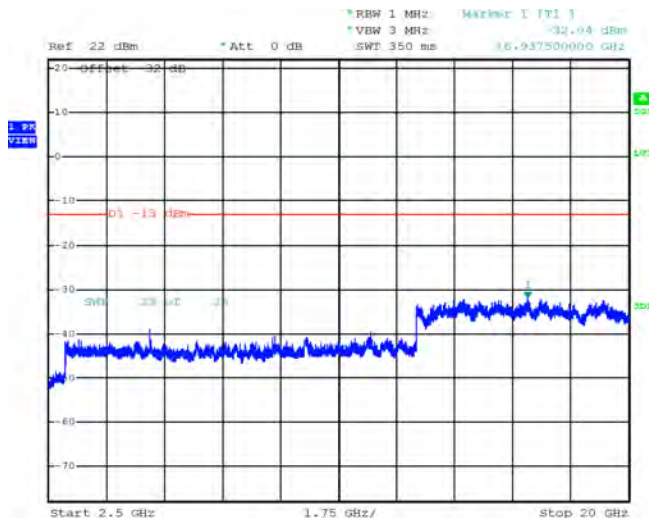


Figure 3-8a: Band 2, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 50)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-9a: Band 2, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 50)

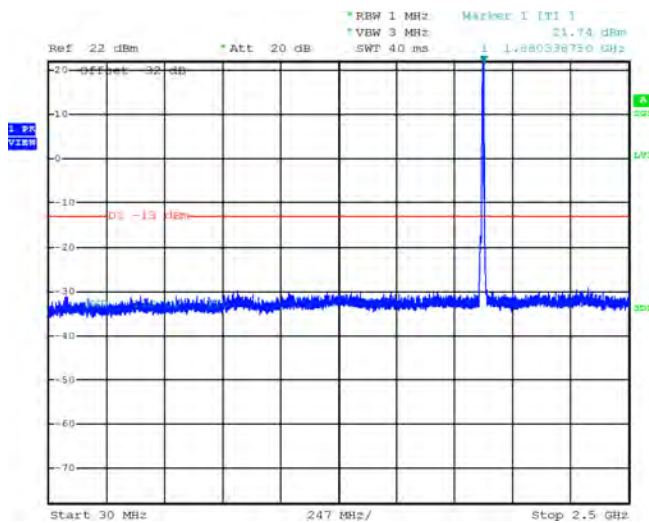


Figure 3-10a: Band 2, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 50)

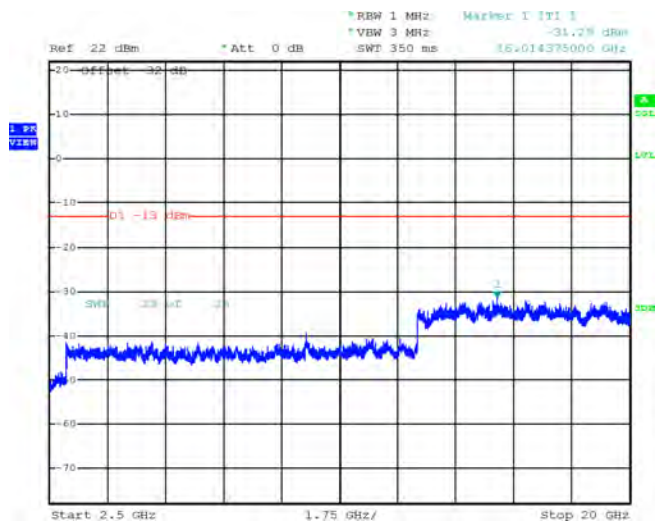


Figure 3-11a: Band 2, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)

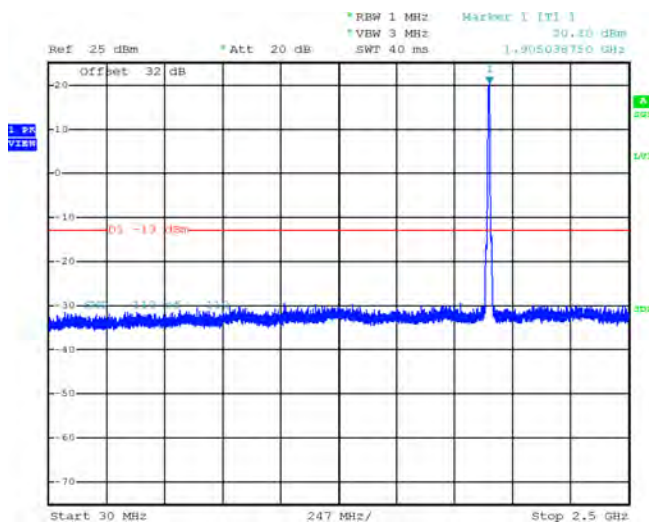
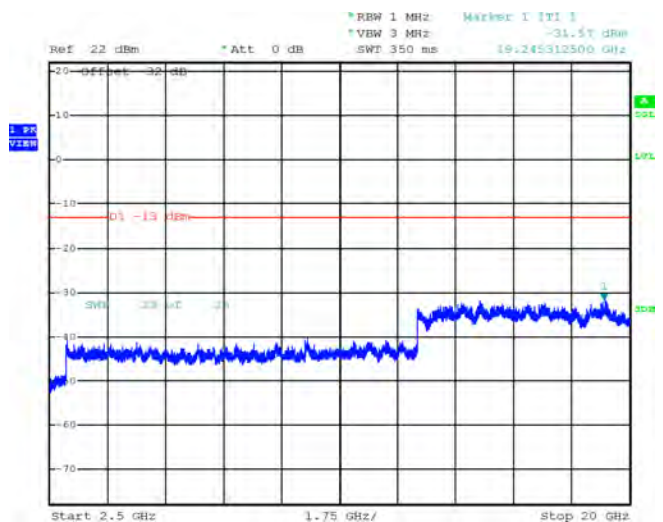


Figure 3-12a: Band 2, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-13a: Band 2, Spurious Conducted Emissions, Low channel, 1.4MHz BW (RB= 6)

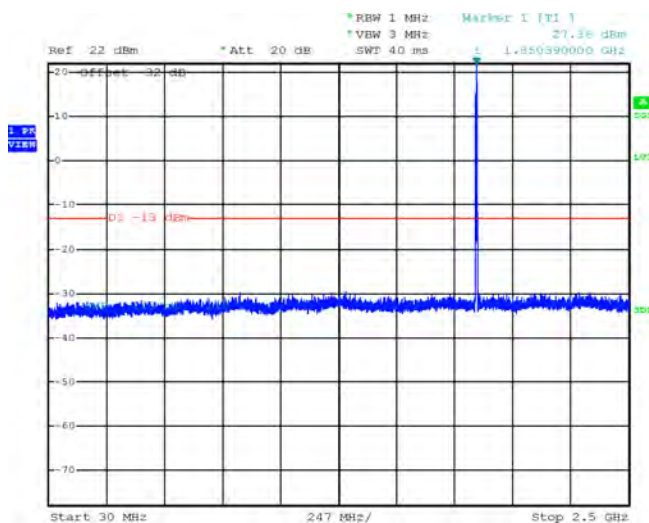


Figure 3-14a: Band 2, Spurious Conducted Emissions, Low channel, 1.4MHz BW (RB= 6)

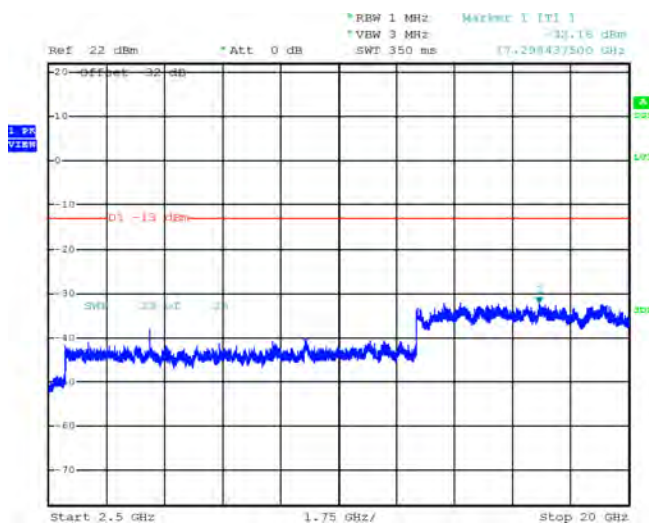


Figure 3-15a: Band 2, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 6)

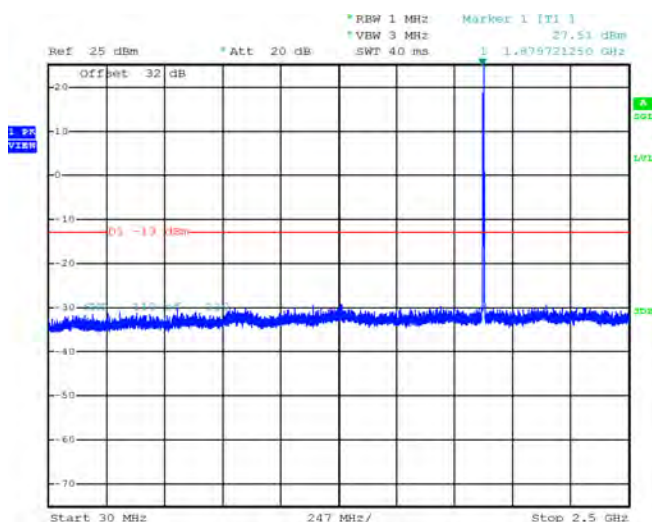
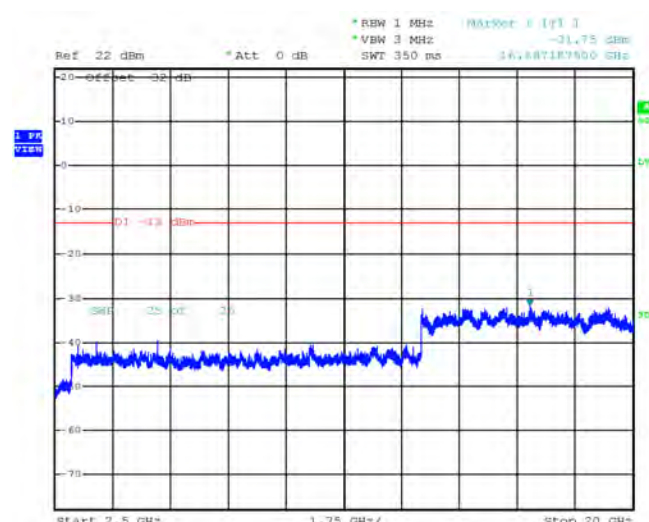


Figure 3-16a: Band 2, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 6)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-17a: Band 2, Spurious Conducted Emissions, High Channel, 1.4MHz BW (RB= 6)

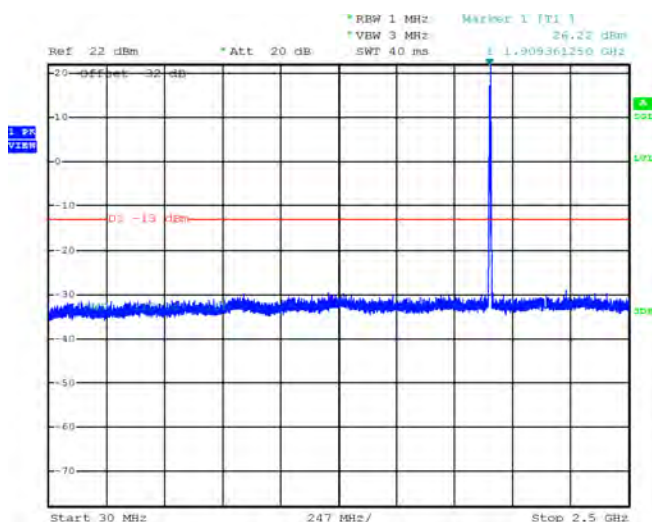


Figure 3-18a: Band 2, Spurious Conducted Emissions, High Channel, 1.4MHz BW (RB= 6)

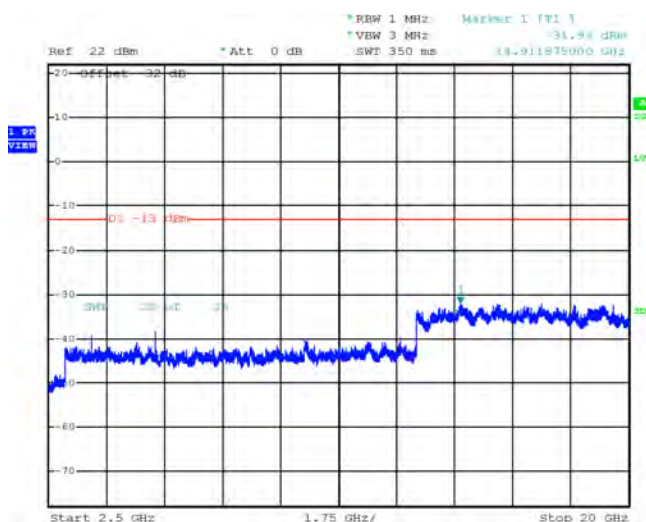


Figure 3-19a: Occupied Bandwidth, Band 2 Low Channel, 20MHz BW (RB= 100)

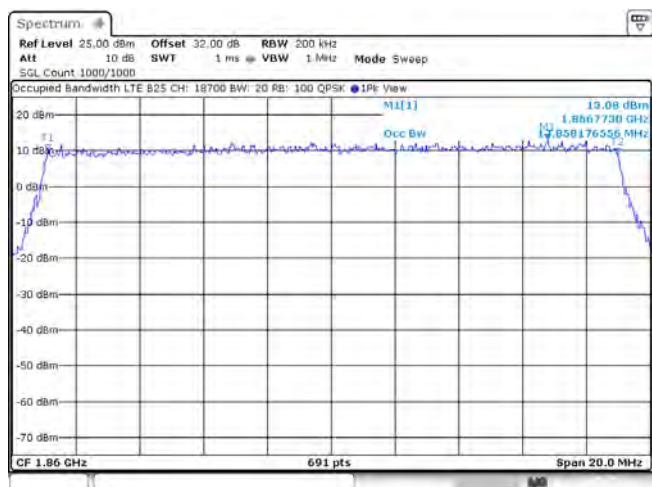
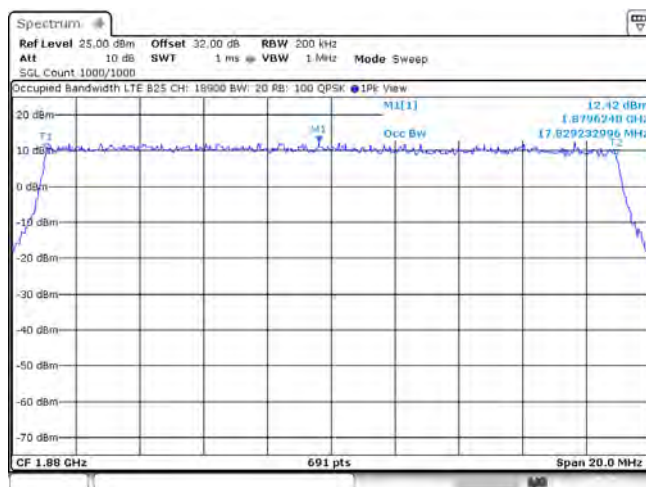


Figure 3-20a: Occupied Bandwidth, Band 2 Middle Channel, 20MHz BW (RB= 100)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-21a: Occupied Bandwidth, Band 2 High Channel, 20MHz BW (RB= 100)

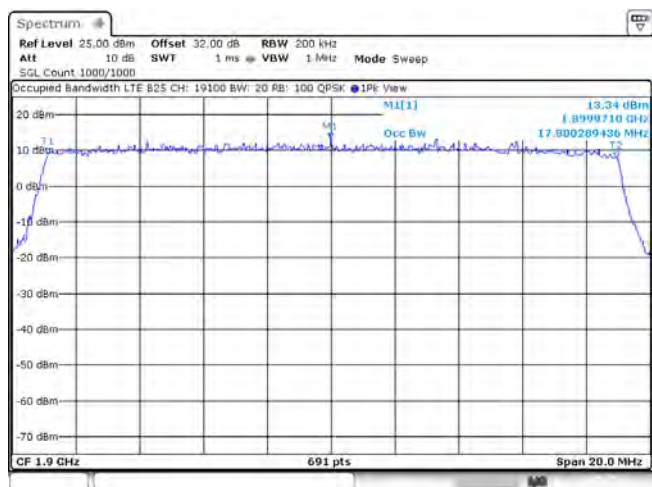


Figure 3-22a: -26 dBc Bandwidth, Band 2 Low Channel, 20MHz BW (RB= 100)

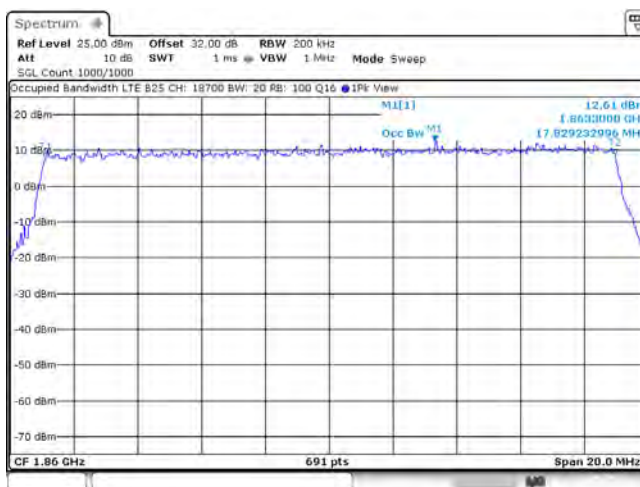


Figure 3-23a: -26 dBc Bandwidth, Band 2 Middle Channel, 20MHz BW (RB= 100)

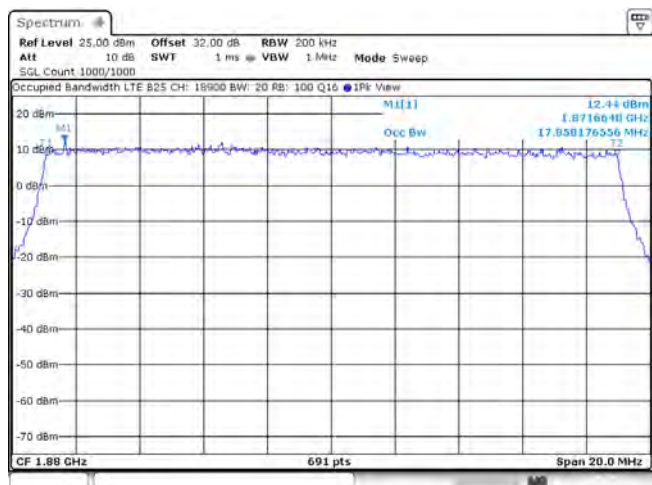
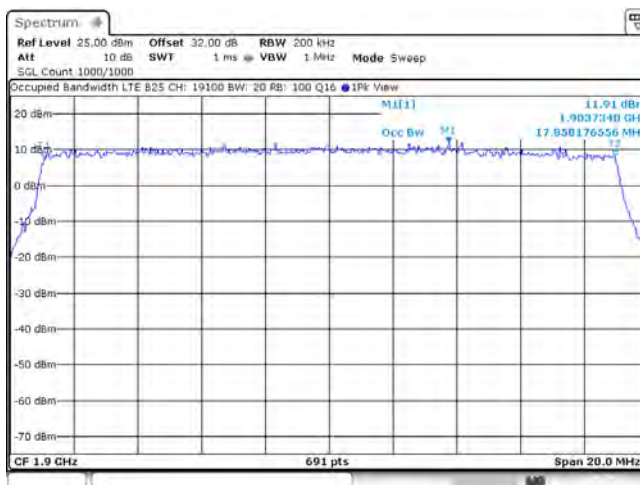


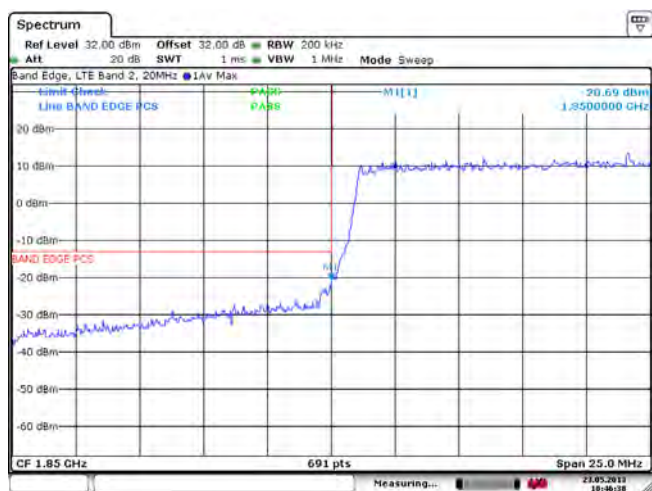
Figure 3-24a: -26 dBc Bandwidth, Band 2 High Channel, 20MHz BW (RB= 100)



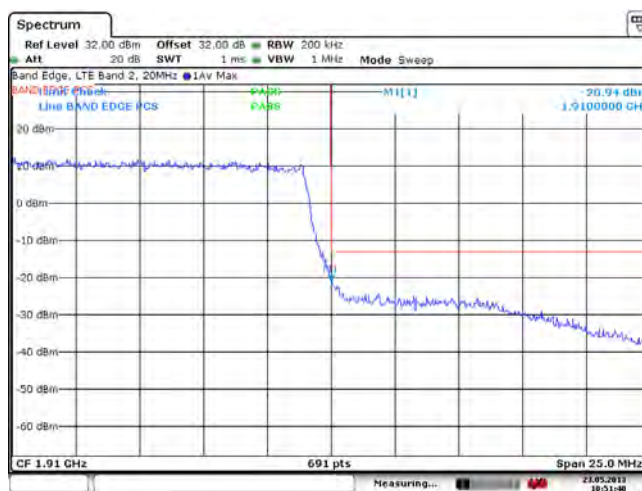
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

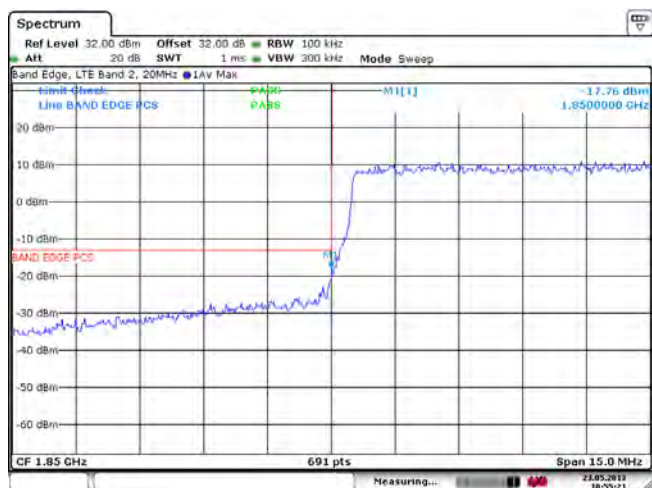
**Figure 3-25a: Band 2 Low Channel Mask, 20MHz
BW, RB = 100**



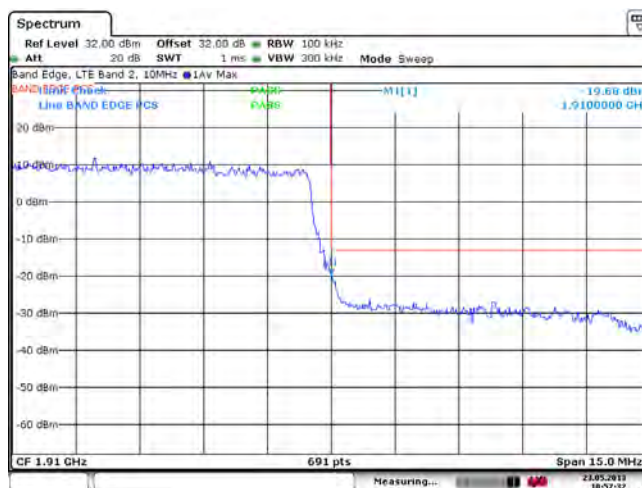
**Figure 3-26a: Band 2 High Channel Mask, 20MHz
BW, RB = 100**



**Figure 3-27a: Band 2 Low Channel Mask, 10MHz
BW, RB = 50**



**Figure 3-28a: Band 2 High Channel Mask, 10MHz
BW, RB = 50**



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Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-29a: Band 2 Low Channel Mask, 1.4MHz BW, RB = 6

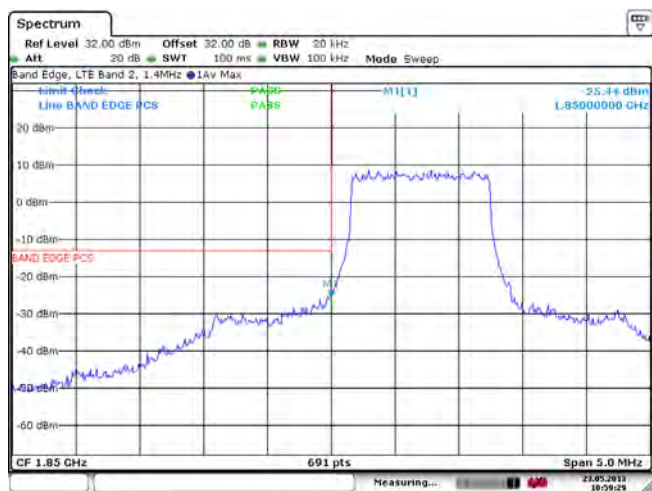


Figure 3-30a: Band 2 High Channel Mask, 1.4MHz BW, RB = 6

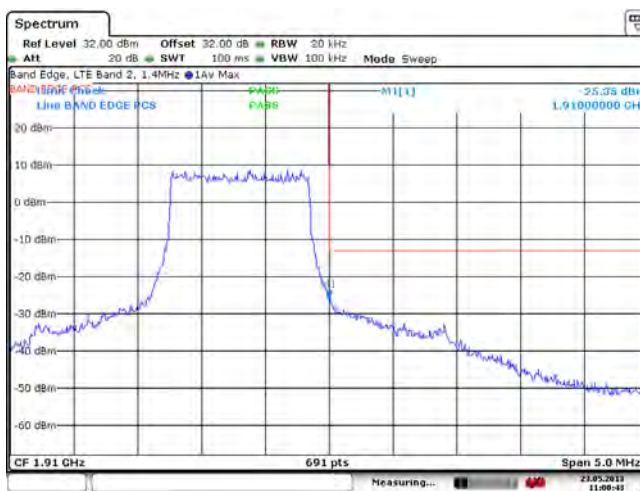


Figure 3-31a: Band 2 Low Channel Mask, 20MHz BW, RB = 1

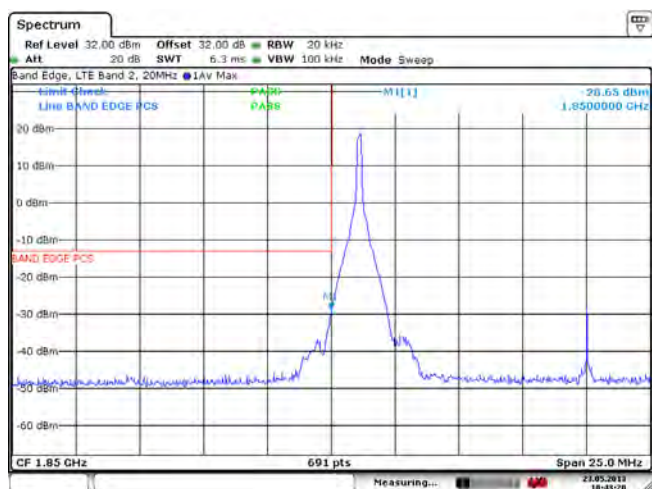
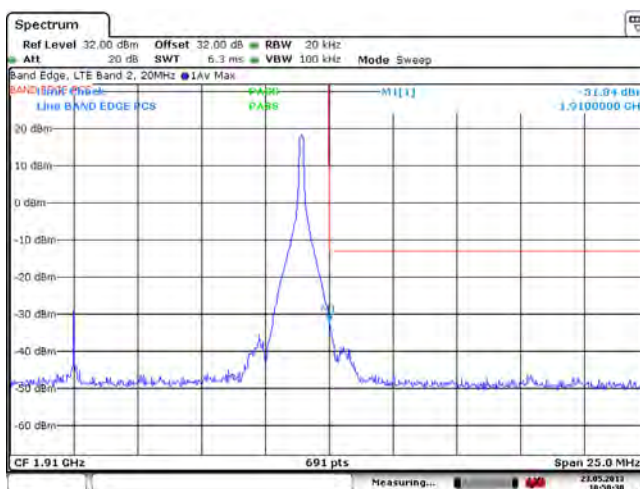


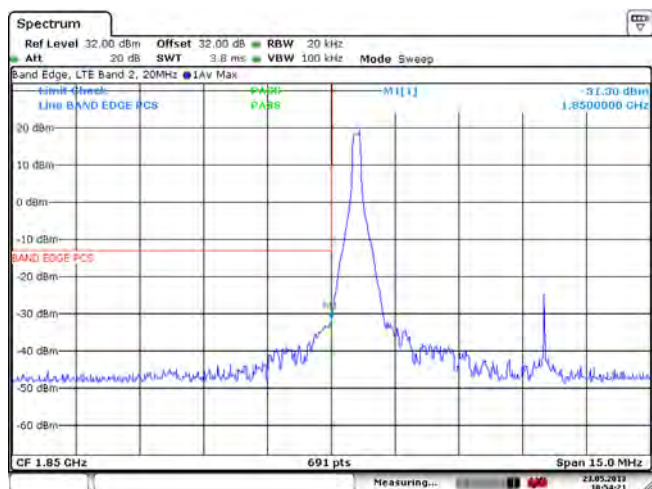
Figure 3-32a: Band 2 High Channel Mask, 20MHz BW, RB = 1



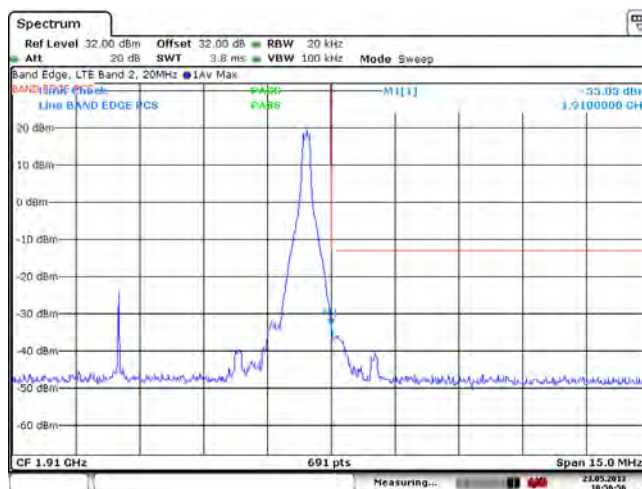
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

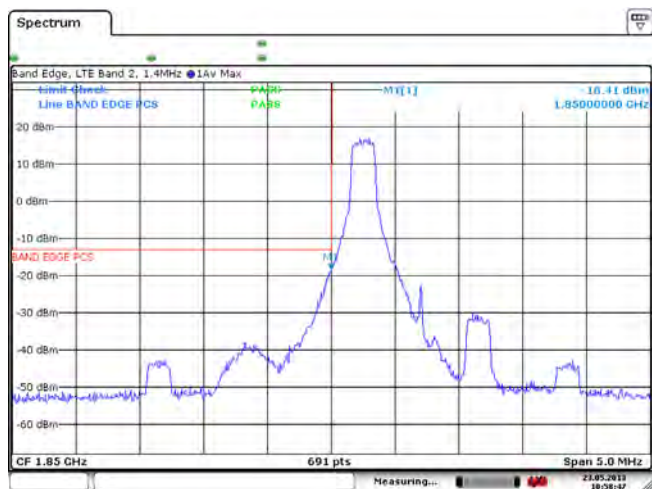
**Figure 3-33a: Band 2 Low Channel Mask, 10MHz
BW, RB = 1**



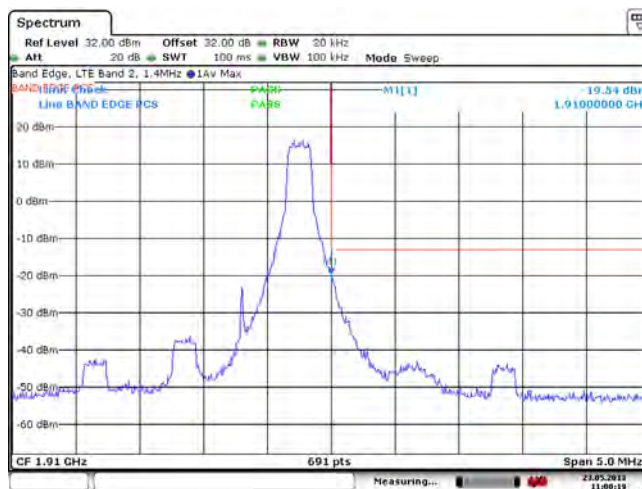
**Figure 3-34a: Band 2 High Channel Mask, 10MHz
BW, RB = 1**



**Figure 3-35a: Band 2 Low Channel Mask, 1.4MHz
BW, RB = 1**



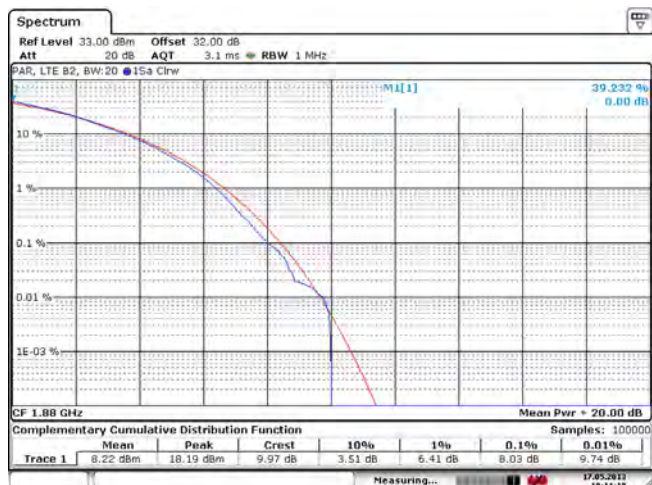
**Figure 3-36a: Band 2 High Channel Mask, 1.4MHz
BW, RB = 1**



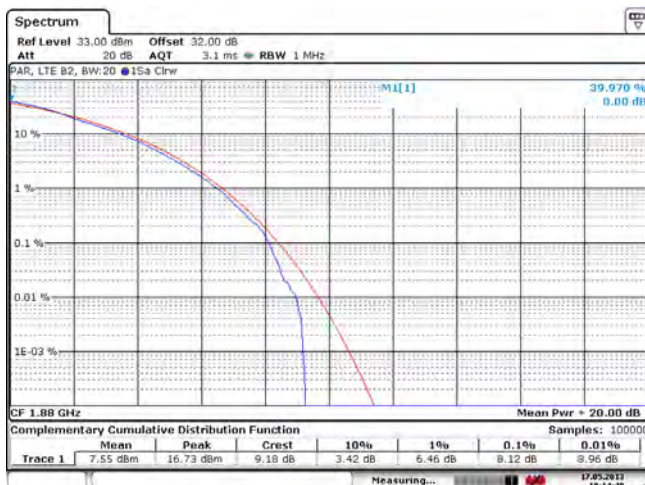
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

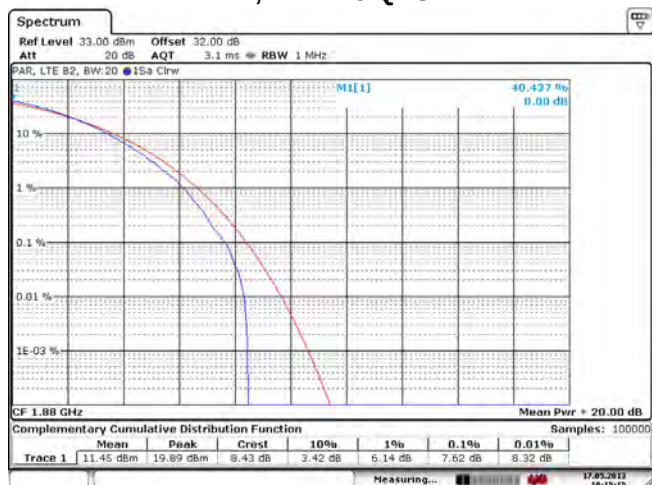
**Figure 3-37a: Band 2, Mid Channel PAR, 20 MHz
BW, RB = 50 QPSK**



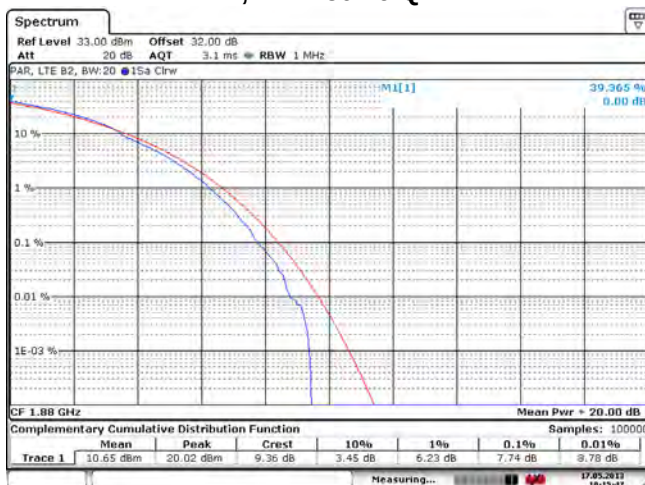
**Figure 3-38a: Band 2, Mid Channel PAR, 20 MHz
BW, RB = 100 16-QAM**



**Figure 3-39a: Band 2, Mid Channel PAR, 10 MHz
BW, RB = 25 QPSK**



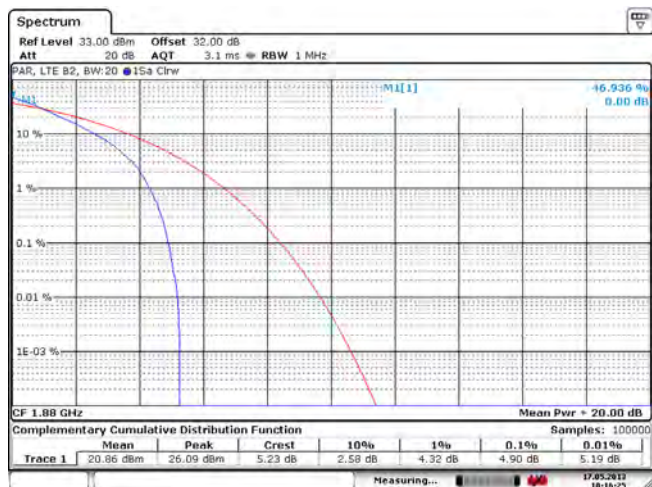
**Figure 3-40a: Band 2, Mid Channel PAR, 10 MHz
BW, RB = 50 16-QAM**



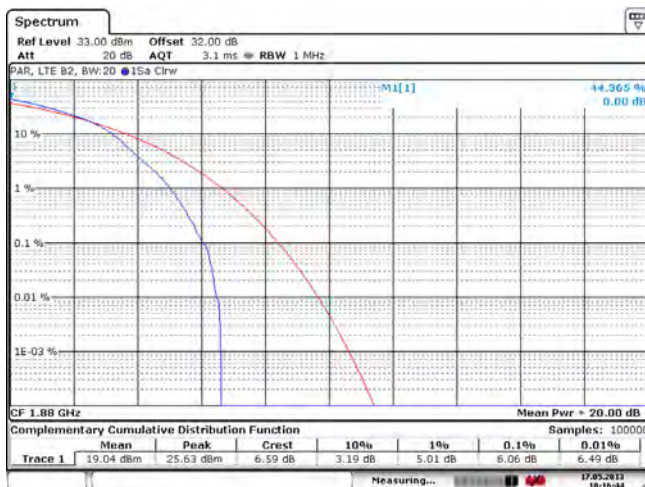
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

**Figure 3-41a: Band 2, Mid Channel PAR, 1.4 MHz
BW, RB = 3 QPSK**



**Figure 3-42a: Band 2, Mid Channel PAR, 1.4 MHz
BW, RB = 6 16-QAM**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW,RFR101LW APPENDIX 3A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 2 Conducted RF Emission Test Data cont'd

Figure 3-43a: Occupied Bandwidth, Band 2 Low Channel, 20MHz BW (RB= 100) 16-QAM

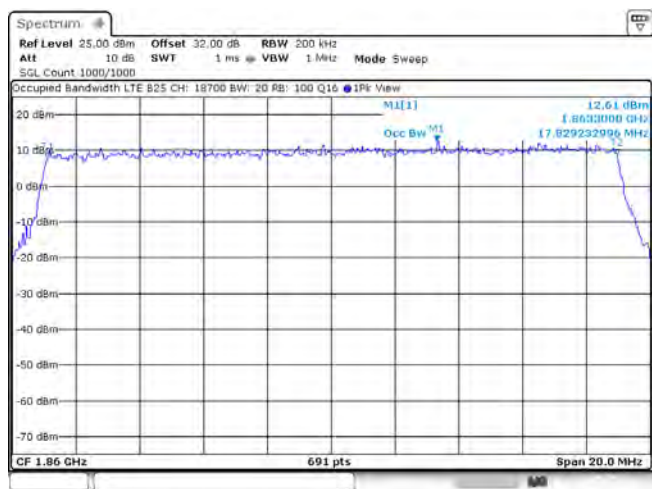


Figure 3-44a: Occupied Bandwidth, Band 2 Mid Channel, 20MHz BW (RB= 100) 16-QAM

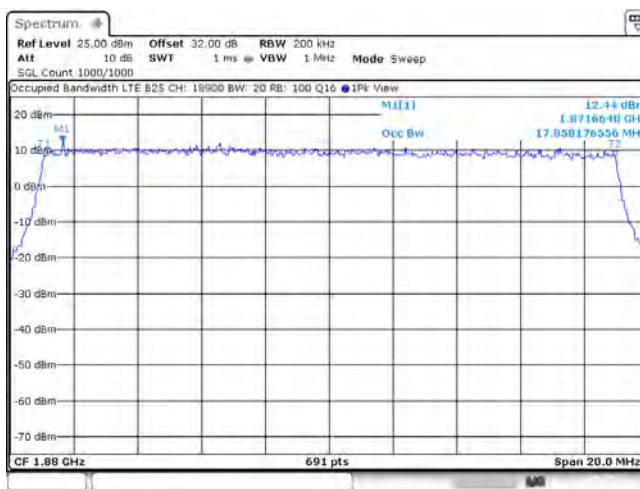
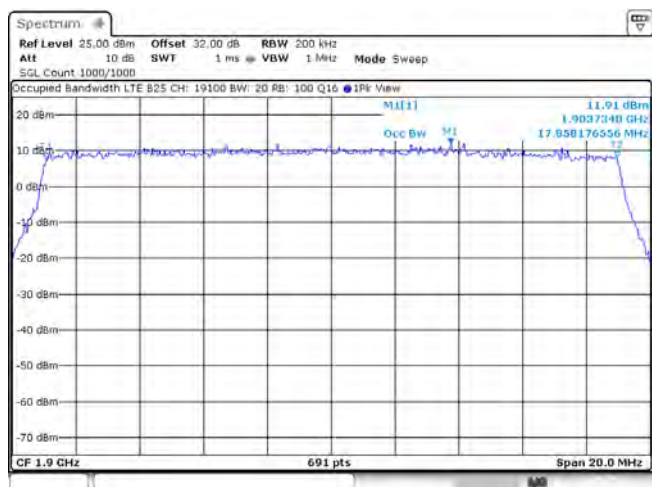


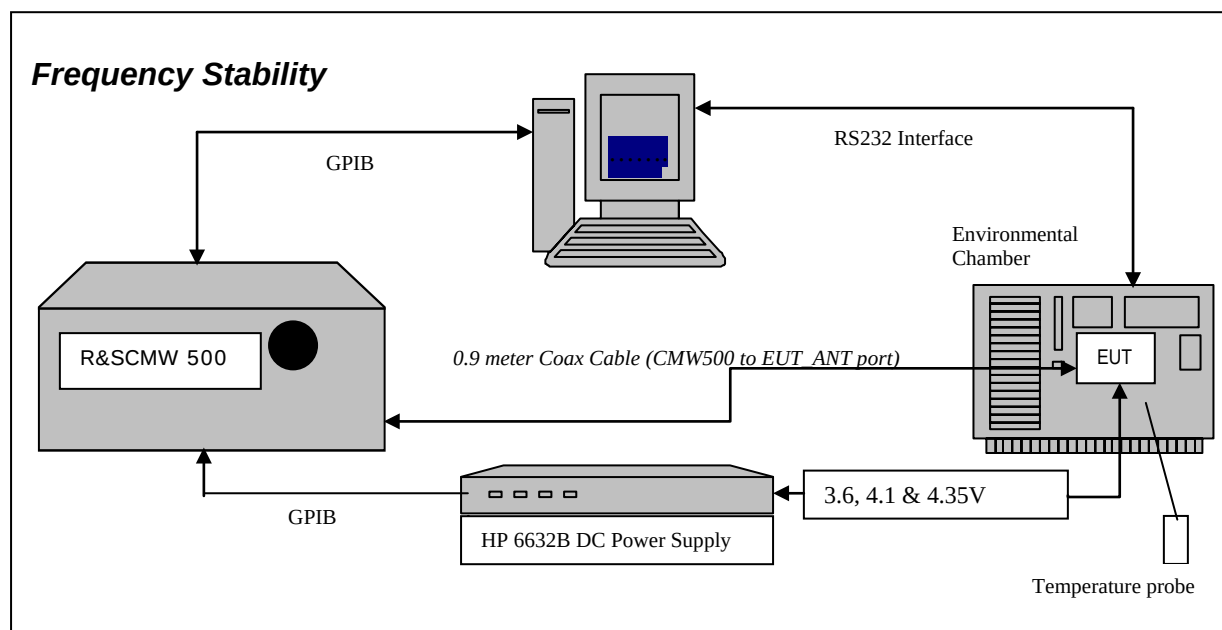
Figure 3-45a: Occupied Bandwidth, Band 2 High Channel, 20MHz BW (RB= 100) 16-QAM



APPENDIX 3B – LTE Band 2 FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 3B		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

LTE 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

24.236 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 and RSS-133, 6.3 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMW 500 and the EUT antenna port.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 3B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 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 CMW 500 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 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 1860.0, 1880.0 and 1900.0 MHz each was measured under bandwidth of 20 MHz with maximum (100) resource blocks. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 3B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Procedure:

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

1. Switch on the HP 6632B power supply; CMW 500 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 CMW 500 Radio Communication Tester.
6. Command the CMW 500 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMW 500, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
10. The CMW 500 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 LTE band 2 measured was **0.0104 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 3B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Date of test: May 17, 2013

LTE band 2 results: channels 18600, 18900, & 19199 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	3.6	20	11.11	0.0060
18900	1880.0	3.6	20	14.03	0.0075
19199	1900.0	3.6	20	-0.44	-0.0002

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	20	7.70	0.0041
18900	1880.0	4.1	20	11.40	0.0061
19199	1900.0	4.1	20	-3.23	-0.0017

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	20	11.04	0.0059
18900	1880.0	4.35	20	12.51	0.0067
19199	1900.0	4.35	20	-0.64	-0.0003

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

LTE band 2 Results: channel 18600 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	3.6	-30	22.32	0.0120
18600	1860.0	3.6	-20	10.88	0.0058
18600	1860.0	3.6	-10	6.74	0.0036
18600	1860.0	3.6	0	11.35	0.0061
18600	1860.0	3.6	10	12.53	0.0067
18600	1860.0	3.6	20	11.11	0.0060
18600	1860.0	3.6	30	10.41	0.0056
18600	1860.0	3.6	40	14.26	0.0077
18600	1860.0	3.6	50	-7.06	-0.0038
18600	1860.0	3.6	60	11.00	0.0059
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	-30	11.27	0.0061
18600	1860.0	4.1	-20	12.80	0.0069
18600	1860.0	4.1	-10	16.60	0.0089
18600	1860.0	4.1	0	12.36	0.0066
18600	1860.0	4.1	10	14.25	0.0077
18600	1860.0	4.1	20	7.70	0.0041
18600	1860.0	4.1	30	9.46	0.0051
18600	1860.0	4.1	40	15.00	0.0081
18600	1860.0	4.1	50	-4.78	-0.0026
18600	1860.0	4.1	60	10.10	0.0054
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	-30	8.98	0.0048
18600	1860.0	4.35	-20	6.56	0.0035
18600	1860.0	4.35	-10	14.94	0.0080
18600	1860.0	4.35	0	11.13	0.0060
18600	1860.0	4.35	10	13.14	0.0071
18600	1860.0	4.35	20	11.04	0.0059
18600	1860.0	4.35	30	19.32	0.0104
18600	1860.0	4.35	40	-5.63	-0.0030
18600	1860.0	4.35	50	15.58	0.0084
18600	1860.0	4.35	60	14.74	0.0079

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW **IC:** 2503A-RFS120LW
FCC ID: L6ARFR100LW **IC:** 2503A-RFR100LW

LTE band 2 Results: channel 18900 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	3.6	-30	13.24	0.0070
18900	1880.00	3.6	-20	9.06	0.0048
18900	1880.00	3.6	-10	11.09	0.0059
18900	1880.00	3.6	0	-3.83	-0.0020
18900	1880.00	3.6	10	8.61	0.0046
18900	1880.00	3.6	20	14.03	0.0075
18900	1880.00	3.6	30	13.19	0.0070
18900	1880.00	3.6	40	13.58	0.0072
18900	1880.00	3.6	50	13.80	0.0073
18900	1880.00	3.6	60	15.52	0.0083
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.1	-30	12.29	0.0065
18900	1880.00	4.1	-20	-8.83	-0.0047
18900	1880.00	4.1	-10	-0.14	-0.0001
18900	1880.00	4.1	0	14.97	0.0080
18900	1880.00	4.1	10	9.36	0.0050
18900	1880.00	4.1	20	11.40	0.0061
18900	1880.00	4.1	30	12.58	0.0067
18900	1880.00	4.1	40	10.37	0.0055
18900	1880.00	4.1	50	-10.96	-0.0058
18900	1880.00	4.1	60	12.08	0.0064
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.35	-30	-12.94	-0.0069
18900	1880.00	4.35	-20	4.67	0.0025
18900	1880.00	4.35	-10	13.25	0.0070
18900	1880.00	4.35	0	11.38	0.0061
18900	1880.00	4.35	10	13.34	0.0071
18900	1880.00	4.35	20	12.51	0.0067
18900	1880.00	4.35	30	15.34	0.0082
18900	1880.00	4.35	40	14.19	0.0075
18900	1880.00	4.35	50	12.67	0.0067
18900	1880.00	4.35	60	14.71	0.0078

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW **IC:** 2503A-RFS120LW
FCC ID: L6ARFR100LW **IC:** 2503A-RFR100LW

LTE band 2 Results: channel 19199 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	3.6	-30	-7.05	-0.0037
19199	1900.0	3.6	-20	-3.84	-0.0020
19199	1900.0	3.6	-10	6.26	0.0033
19199	1900.0	3.6	0	11.21	0.0059
19199	1900.0	3.6	10	-6.68	-0.0035
19199	1900.0	3.6	20	-0.44	-0.0002
19199	1900.0	3.6	30	-3.70	-0.0019
19199	1900.0	3.6	40	-4.52	-0.0024
19199	1900.0	3.6	50	0.58	0.0003
19199	1900.0	3.6	60	-3.56	-0.0019
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.1	-30	-3.41	-0.0018
19199	1900.0	4.1	-20	-1.06	-0.0006
19199	1900.0	4.1	-10	-9.06	-0.0048
19199	1900.0	4.1	0	-2.27	-0.0012
19199	1900.0	4.1	10	-4.41	-0.0023
19199	1900.0	4.1	20	-3.23	-0.0017
19199	1900.0	4.1	30	-4.35	-0.0023
19199	1900.0	4.1	40	-4.29	-0.0023
19199	1900.0	4.1	50	-8.31	-0.0044
19199	1900.0	4.1	60	-6.87	-0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.35	-30	-1.60	-0.0008
19199	1900.0	4.35	-20	-1.00	-0.0005
19199	1900.0	4.35	-10	-7.88	-0.0041
19199	1900.0	4.35	0	-2.64	-0.0014
19199	1900.0	4.35	10	-3.41	-0.0018
19199	1900.0	4.35	20	-0.64	-0.0003
19199	1900.0	4.35	30	-9.42	-0.0050
19199	1900.0	4.35	40	14.17	0.0075
19199	1900.0	4.35	50	-4.59	-0.0024
19199	1900.0	4.35	60	-0.39	-0.0002

APPENDIX 3C – LTE Band 2 RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of Test: May 15, 2013

The following measurements were performed by Savtej Sandhu.

The environmental tests conditions were: Temperature: 23.6 °C

Relative Humidity: 33.2 %

The BlackBerry® smartphone was standalone, vertically and LCD facing the RX antenna when the turntable is at 0 degree position.

Measurements were performed with QPSK and 16QAM modulations. The smallest test margins are reported below.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

LTE band 2, 20MHz BW, RB=1, QPSK modulation

EUT Band 2, EUTRA E-UTRA, FD-L, F-OFDM Modulation								Substitution Method					
EUT				Rx 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		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	18700	1860.00	2	Horn	V	-26.60	-26.60	V-V	-17.37	23.08	0.20	33.00	9.92
F0	18700	1860.00	2	Horn	H	-27.86		H-H	-16.03				
F0	18900	1880.00	2	Horn	V	-26.29	-26.29	V-V	-16.60	23.54	0.23	33.00	9.46
F0	18900	1880.00	2	Horn	H	-28.20		H-H	-15.40				
F0	19099	1899.90	2	Horn	V	-26.67	-26.67	V-V	-16.83	23.54	0.23	33.00	9.46
F0	19099	1899.90	2	Horn	H	-27.87		H-H	-15.61				

LTE band 2, 20MHz BW, RB=1, 16-QAM modulation

EUT Data 1, EUT Data 2, EUT Data 3								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max (V,H)	Pol.	Reading	Corrected Reading		Limit	Diff to Limit
		(MHz)				(dBuV)	(dBuV)		(dBm)	(W)	(dBm)		
F0	18700	1860.00	2	Horn	V	-27.79	-27.79	V-V	-18.59	21.83	0.15	33.00	11.17
F0	18700	1860.00	2	Horn	H	-28.76		H-H	-17.28				
F0	18900	1880.00	2	Horn	V	-27.39	-27.39	V-V	-17.66	22.47	0.18	33.00	10.53
F0	18900	1880.00	2	Horn	H	-29.18		H-H	-16.47				
F0	19099	1899.90	2	Horn	V	-27.86	-27.86	V-V	-18.09	22.29	0.17	33.00	10.71
F0	19099	1899.90	2	Horn	H	-28.78		H-H	-16.86				

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 3C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Radiated Emissions Test Data Results

Date of Test: May 09, 2013

The following measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 24.1 °C
 Relative Humidity: 32.7 %

The BlackBerry® smartphone was standalone, vertically and LCD facing 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 LTE band 2 with QPSK modulation for 1.4MHz BW (channel 18607, 18900 and 19192 with RB = 1), 5MHz BW (channel 18625, 18900 and 19174 with RB = 1) and 20MHz BW (channel 18700, 18900, 19099 with RB = 100 and RB = 1), in QPSK modulation; with 16-QAM modulation for 1.4MHz BW (channel 18900 with RB=1), 5MHz BW (channel 18900 with RB = 1) and 20MHz BW (channel 18900 with RB = 100 and RB = 1).

All emissions were at least 25 dB below the limit.

Date of Test: May 13, 2012 to May 27, 2013

The following measurements were performed by Mahmood Ahmed.

The environmental test conditions were: Temperature: 24.4 °C
 Relative Humidity: 32.2 %

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 LCD screen facing up and the top pointing to the RX antenna when the turntable is at 0 degree position
Measurements were performed in LTE band 2 with QPSK modulation for 1.4MHz BW (channel 18607, 18900 and 19192 with RB = 1), 5MHz BW (channel 18625, 18900 and 19174 with RB = 1) and 20MHz BW (channel 18700, 18900, 19099 with RB = 100 and RB = 1), in QPSK modulation; with 16-QAM modulation for 1.4MHz BW (channel 18900 with RB = 1), 5MHz BW (channel 18900 with RB = 1) and 20MHz BW (channel 18900 with RB = 100 and RB = 1).

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW **IC:** 2503A-RFS120LW
FCC ID: L6ARFR100LW **IC:** 2503A-RFR100LW

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)							
7404.33	18700	V	2.00	196	PK	40.43	-76.23	-35.81	-13.00	-22.8
9255.59	18700	V	1.00	250	PK	36.9	-73.06	-36.16	-13.00	-23.2

All other emissions were at least 25 dB below the limit.

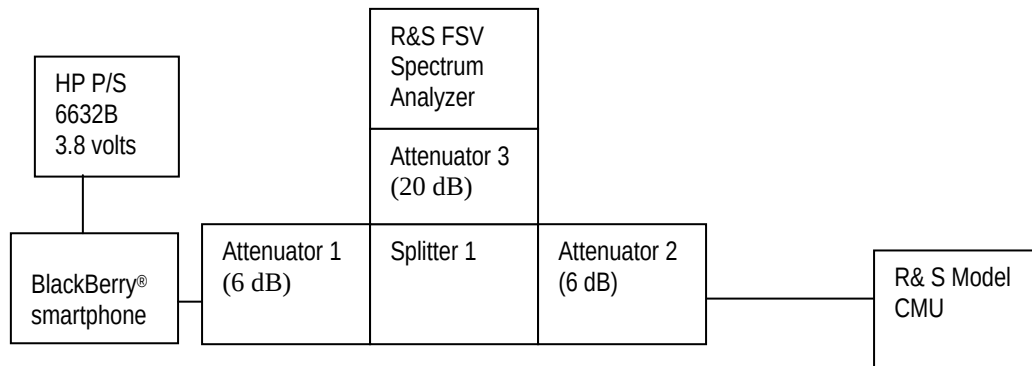
APPENDIX 4A – LTE Band 5 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

LTE Band 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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: May 16 and May 28, 2013

The environmental test conditions were: Temperature: 22.2– 23.1 °C
 Relative Humidity: 20.1 – 44 %

The following measurements were performed by Berkin Can.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Emission Designator Table

LTE Band 5 Frequency (MHz)	Conducted Output Power (dBm)	RB Size	RB Offset	Emission Designator	RB Size	RB Offset	Band	Bandwidth (MHz)	Modulation
824.7	23.31	1	0	1M09G7D	6	0	LTE B5	1.4	QPSK
824.7	22.18	1	0	1M09D7W	6	0	LTE B5	1.4	16QAM
836.5	23.36	1	8	2M68G7D	15	0	LTE B5	3	QPSK
836.5	22.12	1	8	2M68D7W	15	0	LTE B5	3	16QAM
826.5	23.27	1	0	4M47G7D	25	0	LTE B5	5	QPSK
836.5	22.65	1	13	4M47D7W	25	0	LTE B5	5	16QAM
836.5	23.41	1	25	8M92G7D	50	0	LTE B5	10	QPSK
829	22.62	1	0	8M92D7W	50	0	LTE B5	10	16QAM

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 22.917 and RSS-132, 4.5 were measured from 30 MHz to 20 GHz.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each 1.4MHz, 3MHz, 5MHz, 10MHz with different number of resource blocks as per scalable bandwidths for LTE band 5, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.

QPSK and 16-QAM modulations were applied to each of the bandwidths. Only the worst case measurements are documented in this report.

A minimum resource block condition was also measured (RB = 1).

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 LTE band 5 was measured to be 9.247 MHz. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A		
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Test Data for LTE Band 5 selected Frequencies in 10MHz BW (RB = 50)

LTE Band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	QPSK	16-QAM
829.0	9.247	8.944	8.944
836.5	9.247	8.944	8.929
843.9	9.247	8.929	8.915

Measurement Plots for LTE Band 5

See Figures 4-1a to 4-18a for the plots of the conducted spurious emissions.

See Figures 4-19a to 4-36a and 4-45a to 4-47a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

See Figures 4-37a to 4-44a for the plots of the Channel mask.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-1a: Band 5, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)

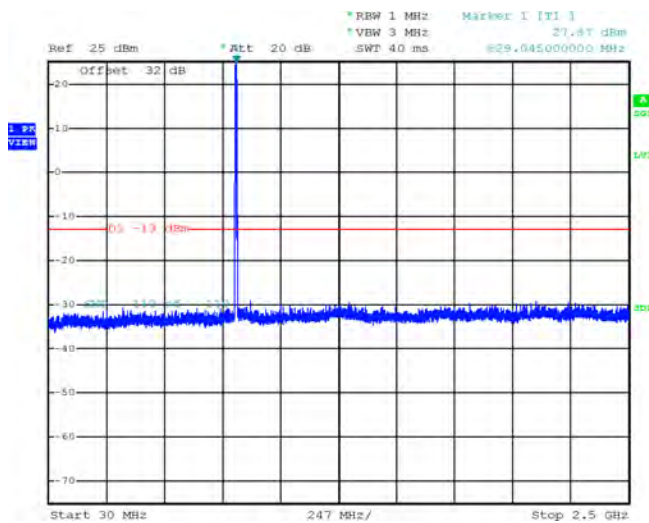


Figure 4-2a: Band 5, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)

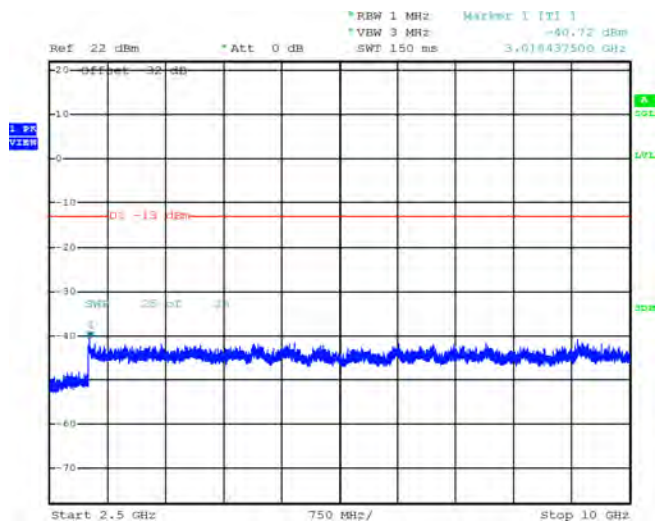


Figure 4-3a: Band 5, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)

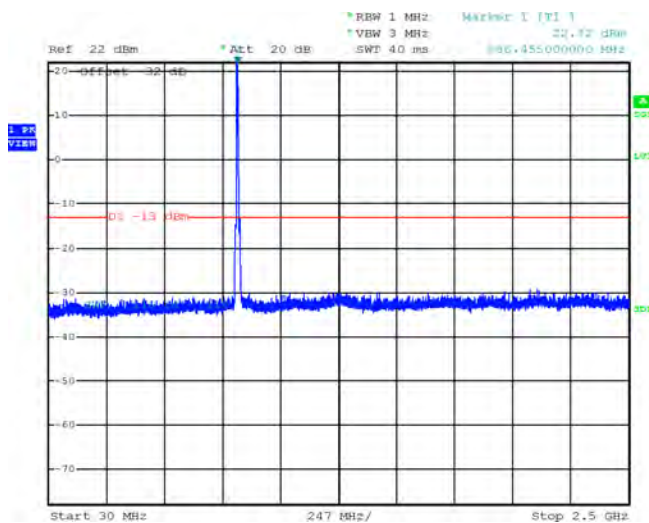
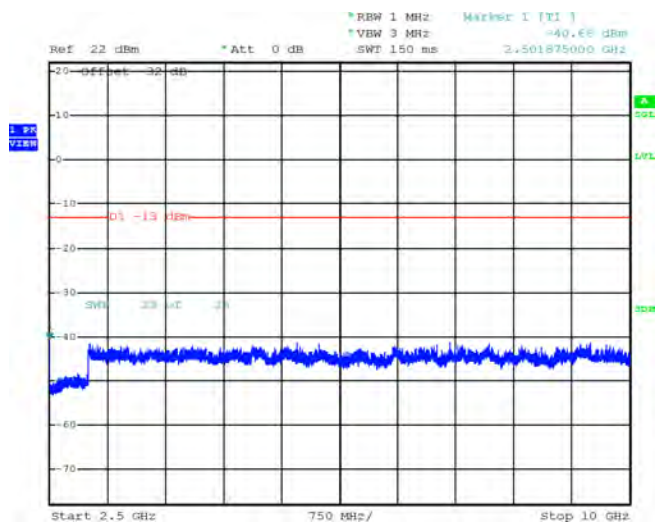


Figure 4-4a: Band 5, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-5a: Band 5, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)

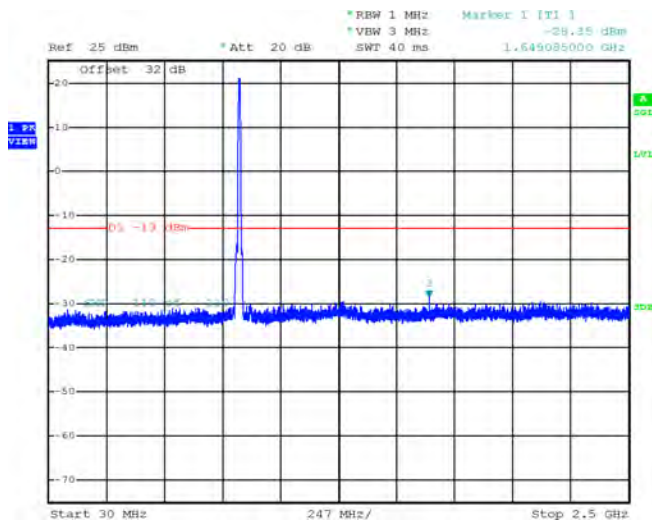


Figure 4-6a: Band 5, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)

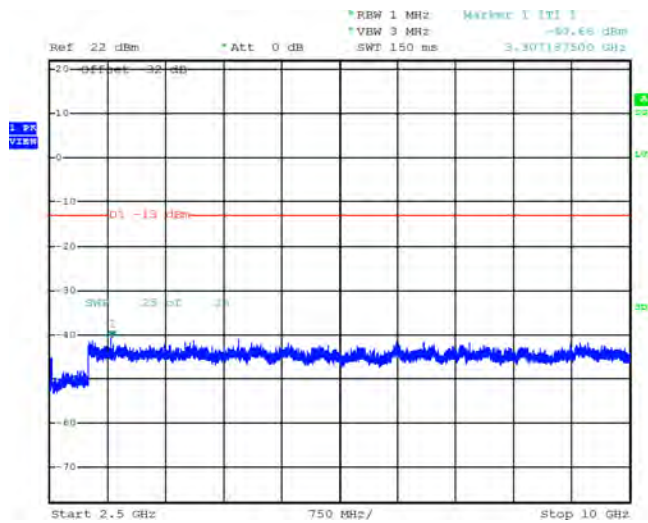


Figure 4-7a: Band 5, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)

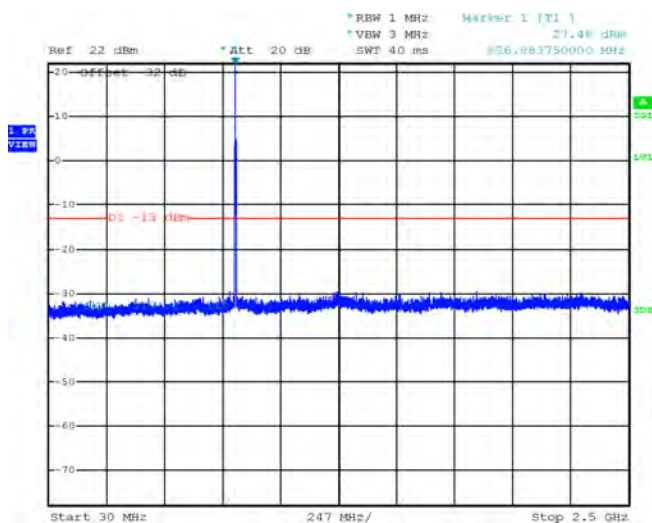
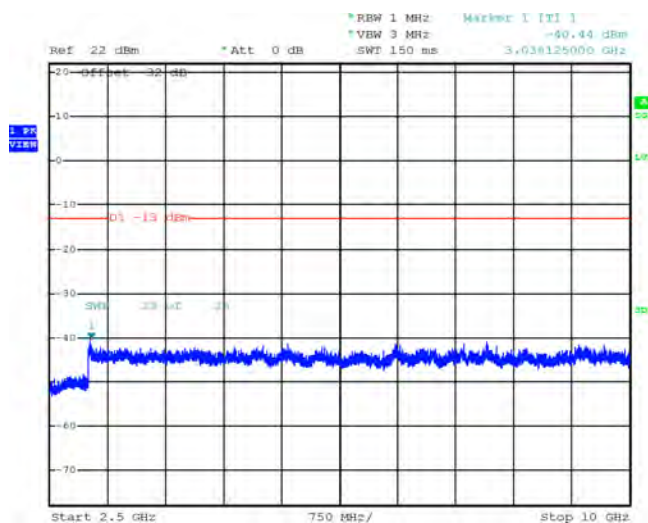


Figure 4-8a: Band 5, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-9a: Band 5, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)

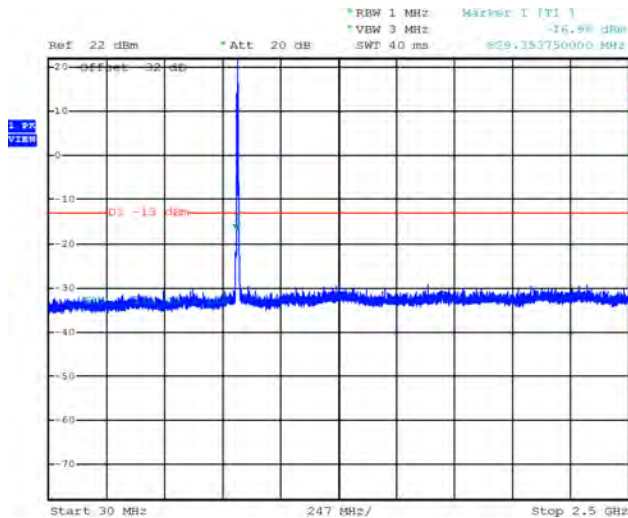


Figure 4-10a: Band 5, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)

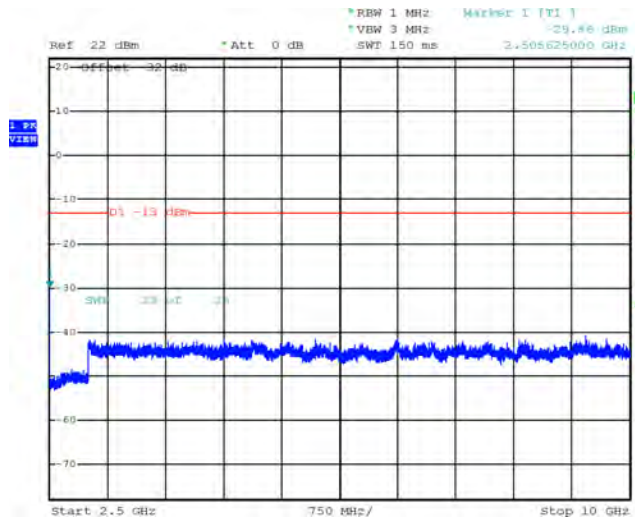


Figure 4-11a: Band 5, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)

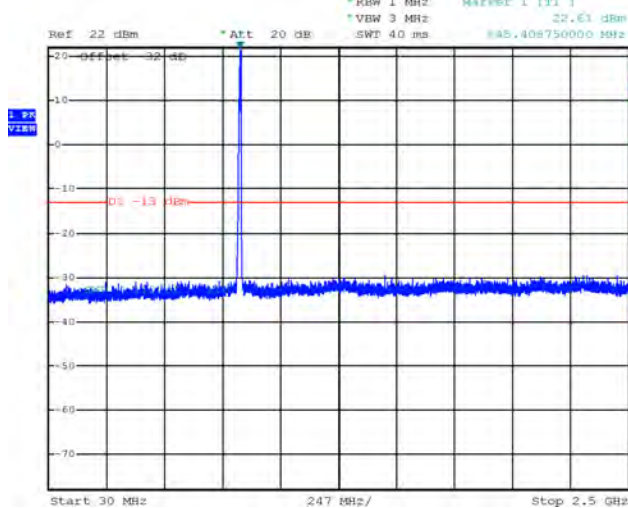
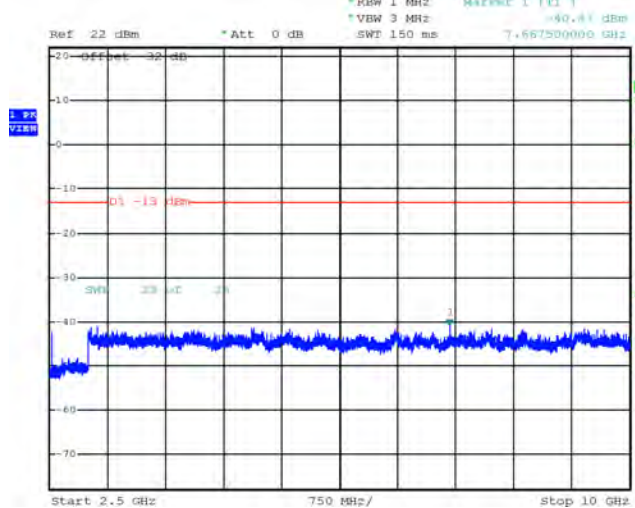


Figure 4-12a: Band 5, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-13a: Band 5, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)

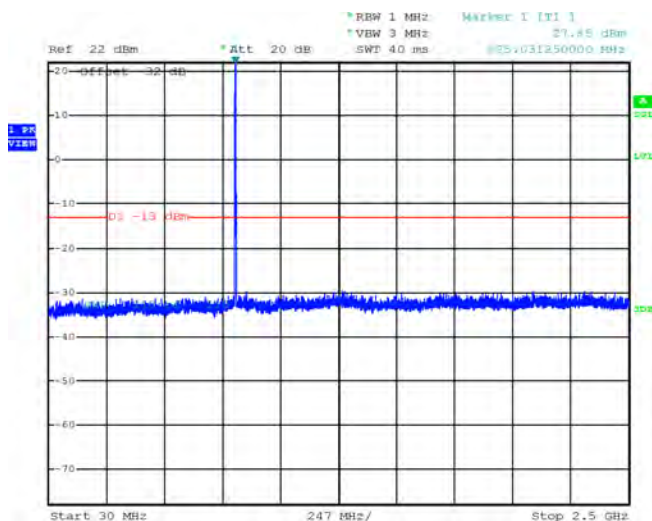


Figure 4-14a: Band 5, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)

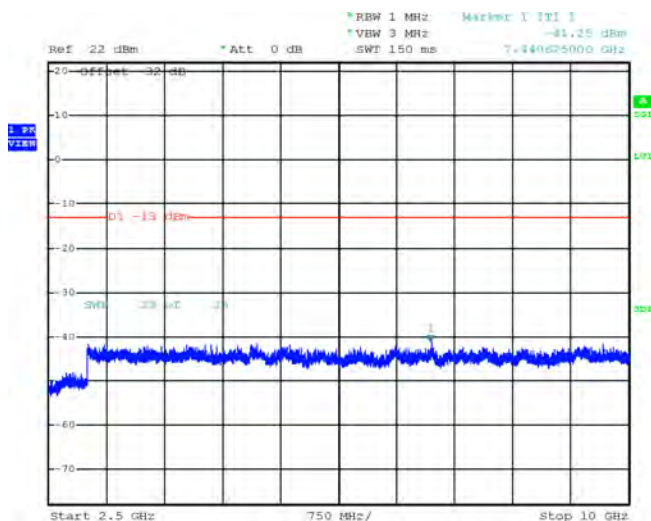


Figure 4-15a: Band 5, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 3)

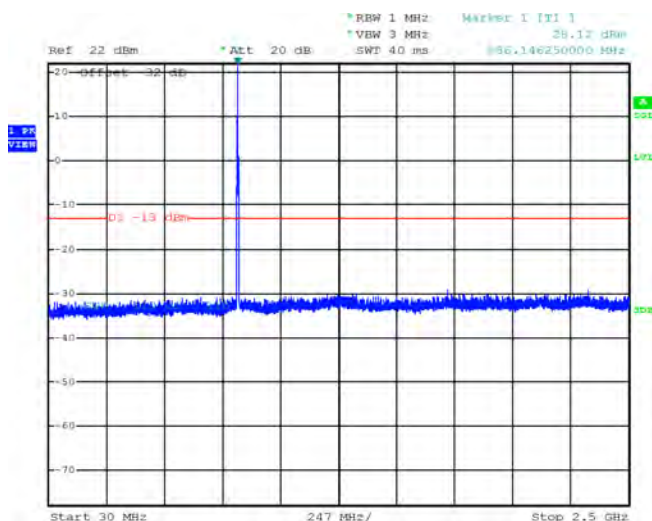
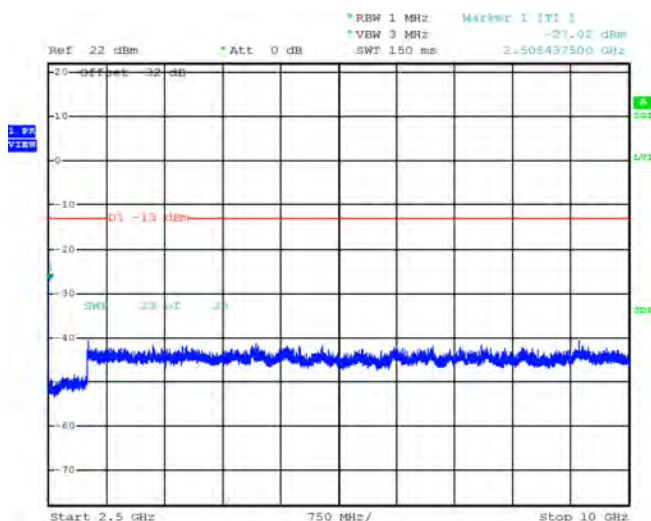


Figure 4-16a: Band 5, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 3)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-17a: Band 5, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)

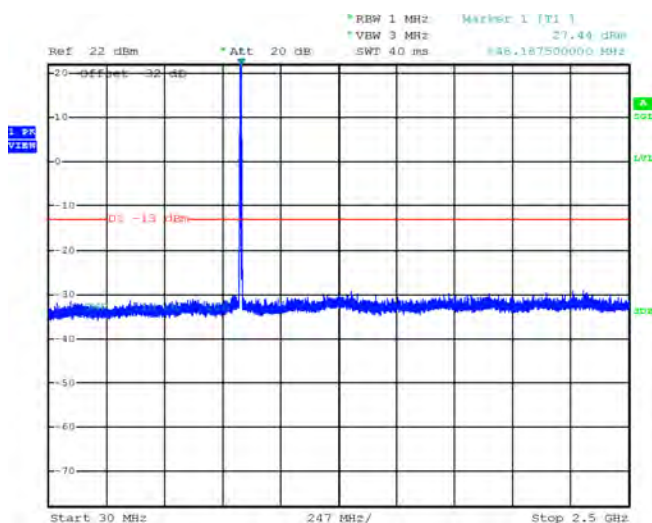
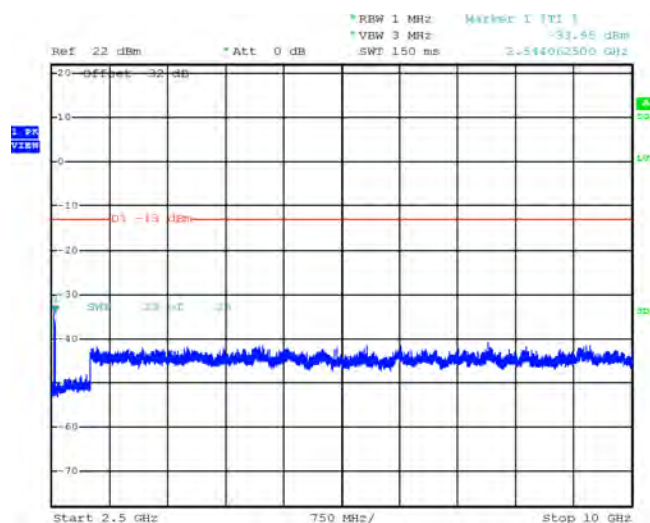


Figure 4-18a: Band 5, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-19a: Occupied Bandwidth, Band 5 Low Channel, 10MHz BW, RB=50

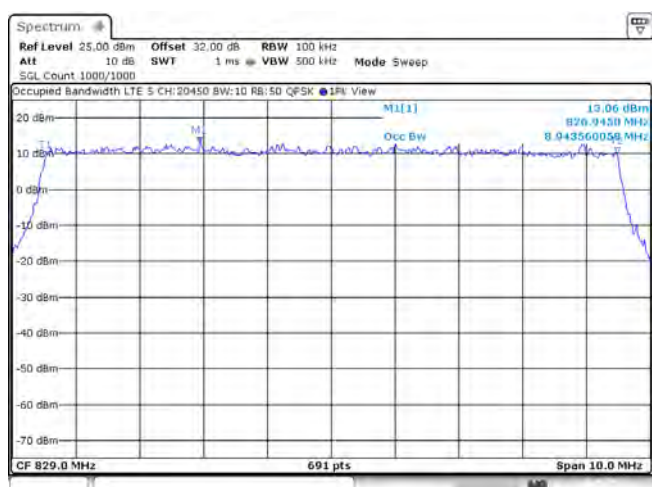


Figure 4-20a: Occupied Bandwidth, Band 5 Middle Channel, 10MHz BW, RB=50

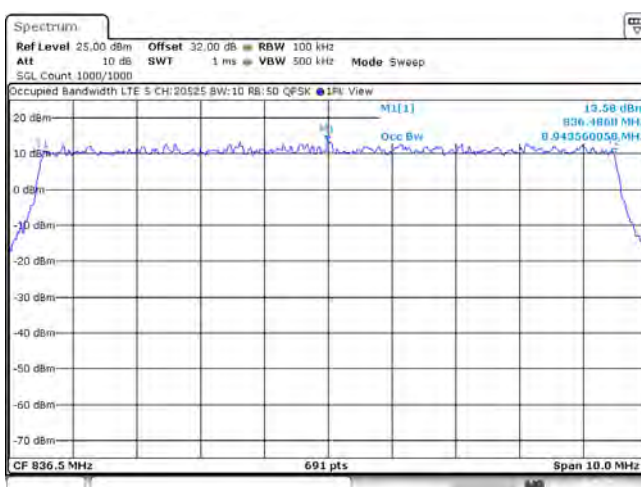
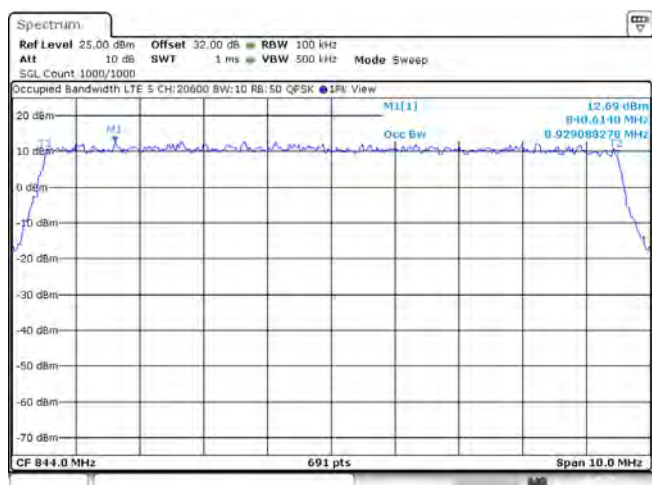


Figure 4-21a: Occupied Bandwidth, Band 5 High Channel, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-22a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25

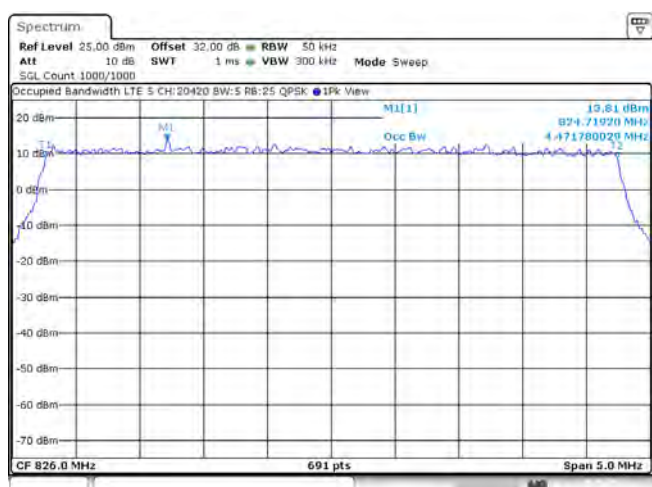


Figure 4-23a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=25

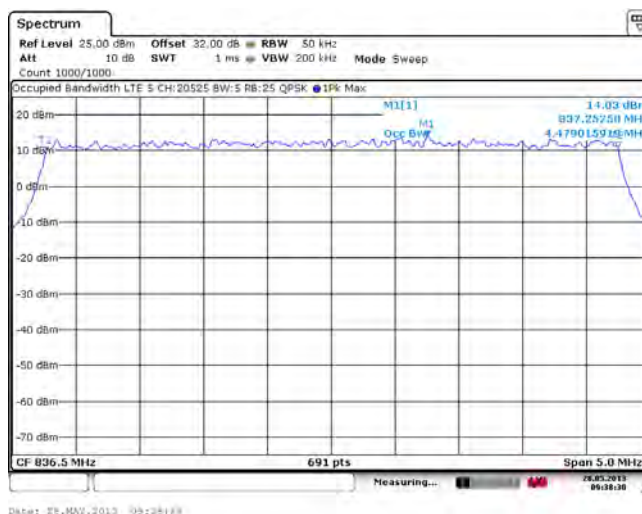
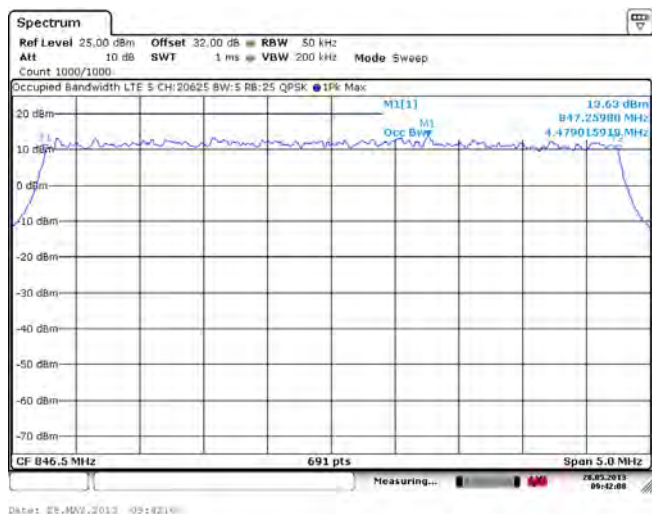


Figure 4-24a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-25a: Occupied Bandwidth, Band 5 Low Channel, 1.4MHz BW, RB=6

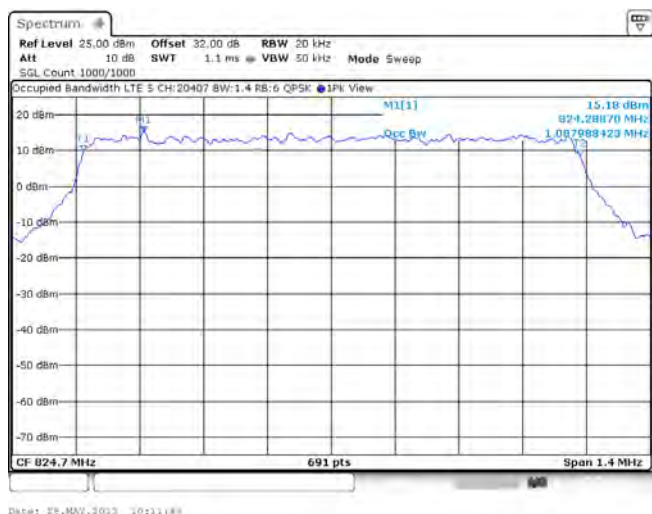


Figure 4-26a: Occupied Bandwidth, Band 5 Middle Channel, 1.4MHz BW, RB=6

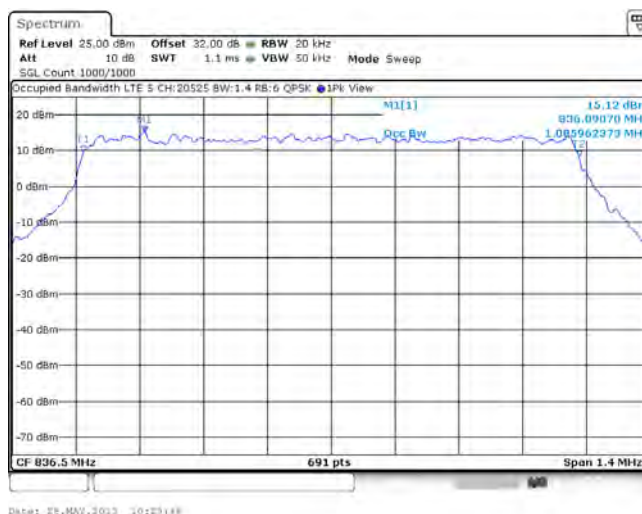
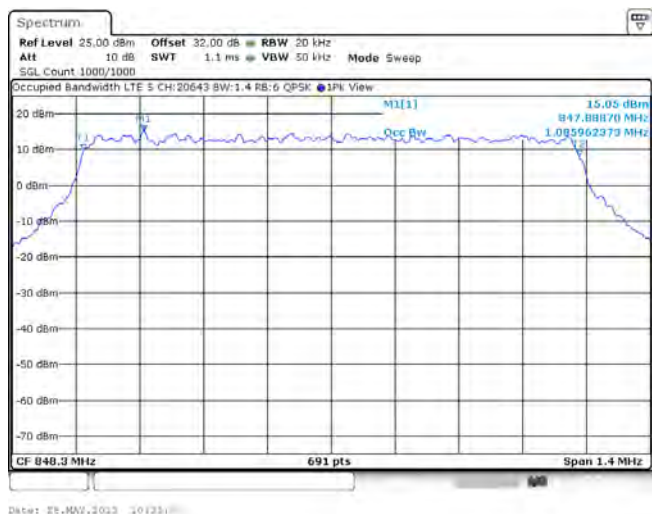


Figure 4-27a: Occupied Bandwidth, Band 5 High Channel, 1.4MHz BW, RB=6



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-28a: -26 dBc Bandwidth, Band 5 Low Channel, 10MHz BW, RB=50

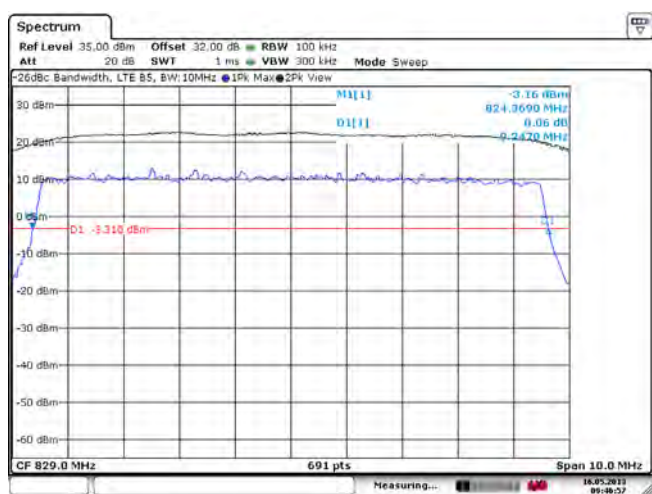


Figure 4-29a: -26 dBc Bandwidth, Band 5 Middle Channel, 10MHz BW, RB=50

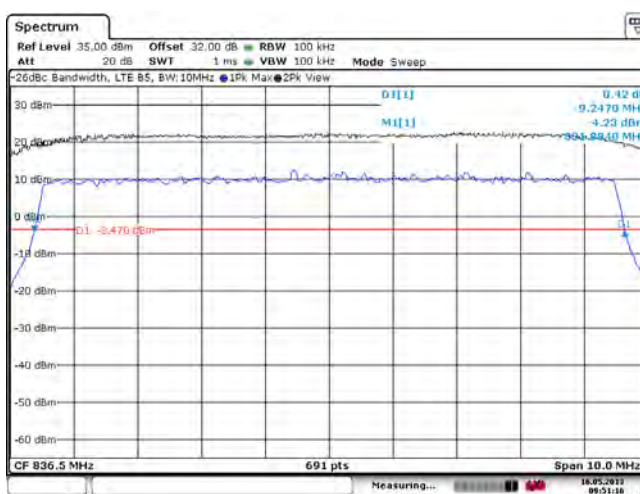


Figure 4-30a: -26 dBc Bandwidth, Band 5 High Channel, 10MHz BW, RB=50

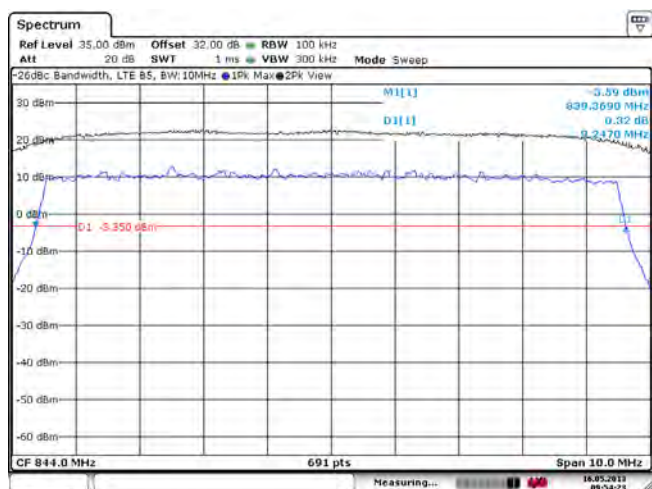
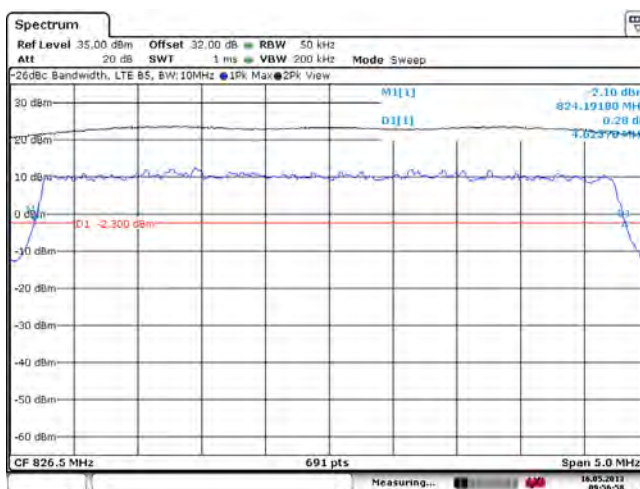


Figure 4-31a: -26 dBc Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-32a: -26 dBc Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=25

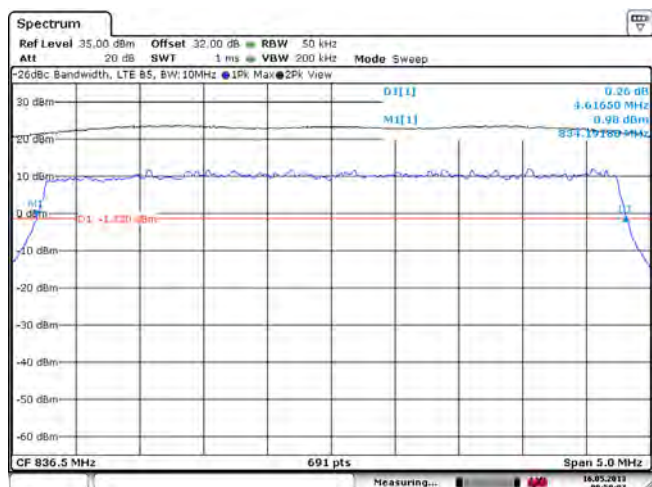


Figure 4-33a: -26 dBc Bandwidth, Band 5 High Channel, 5MHz BW, RB=25

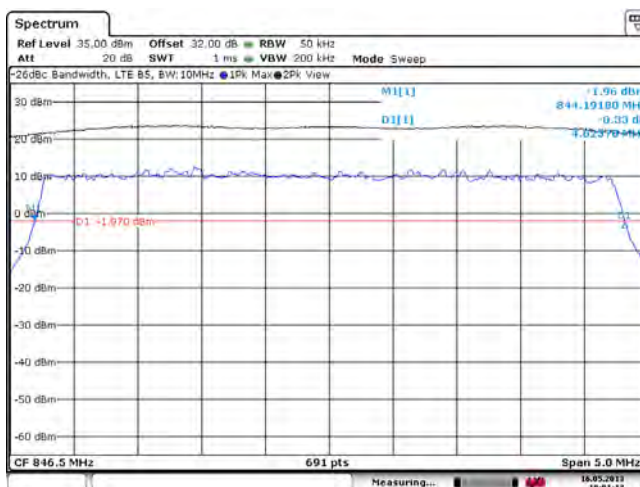


Figure 4-34a: -26 dBc Bandwidth, Band 5 Low Channel, 1.4MHz BW, RB=6

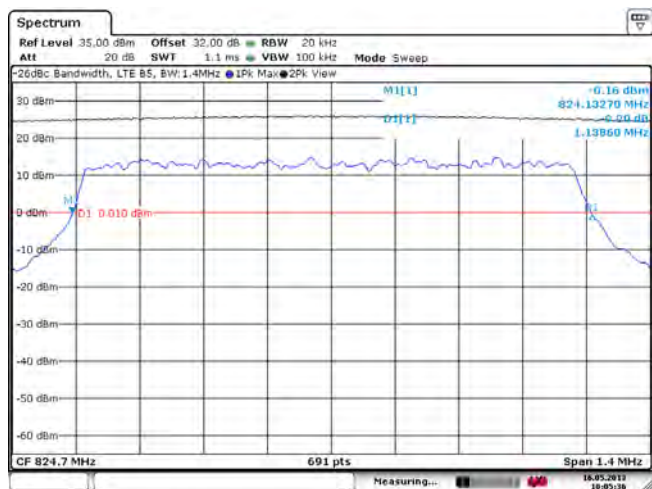
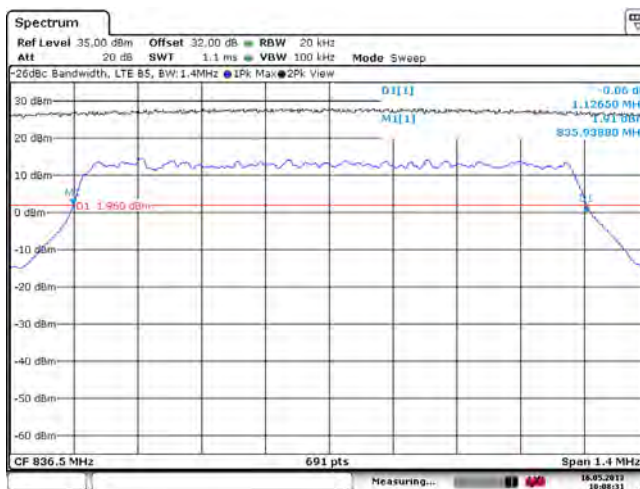


Figure 4-35a: -26 dBc Bandwidth, Band 5 Middle Channel, 1.4MHz BW, RB=6



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-36a: -26 dBc Bandwidth, Band 5 High Channel, 1.4MHz BW, RB=6

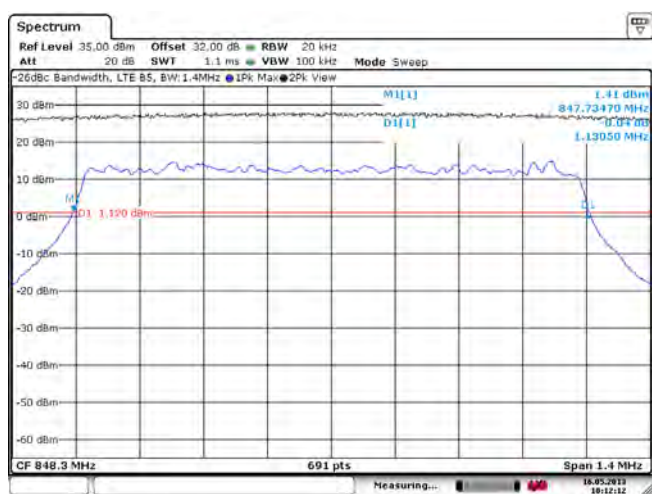


Figure 4-37a: Band 5 Low Channel Mask, 10MHz BW, RB=50

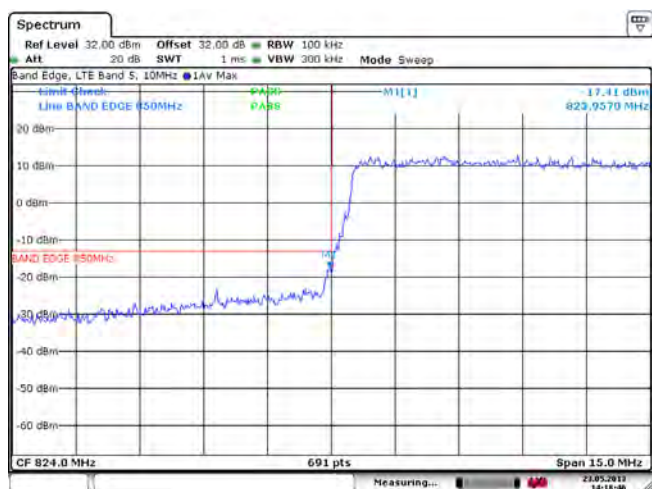
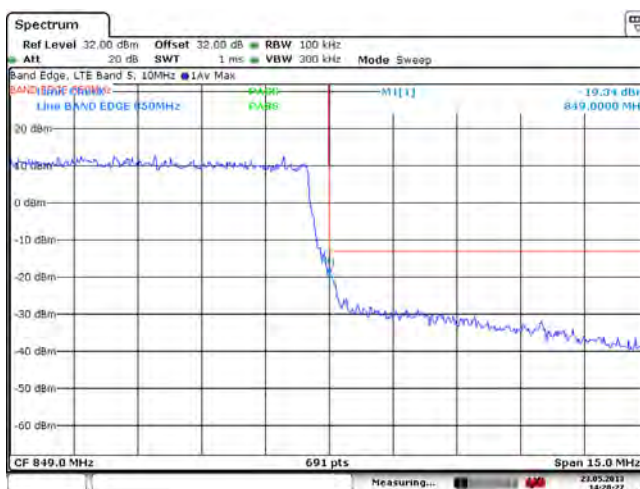


Figure 4-38a: Band 5 High Channel Mask, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-39a: Band 5 Low Channel Mask, 5MHz BW, RB=25

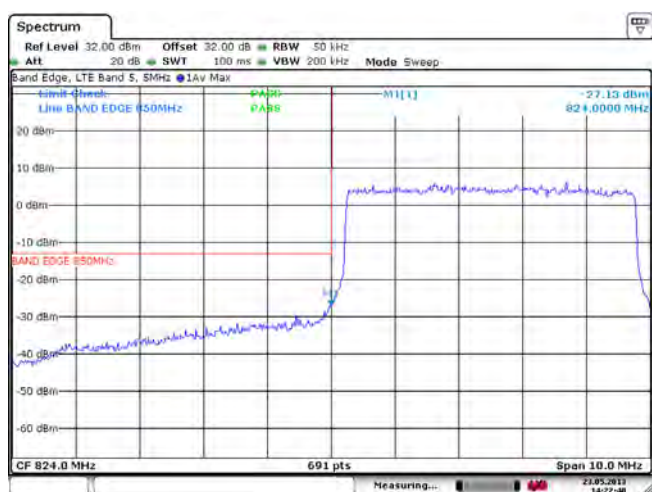


Figure 4-40a: Band 5 High Channel Mask, 5MHz BW, RB=25

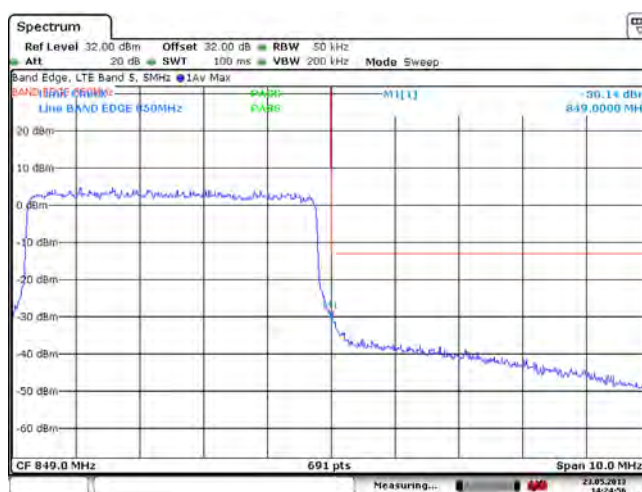


Figure 4-41a: Band 5 Low Channel Mask, 1.4MHz BW, RB=6

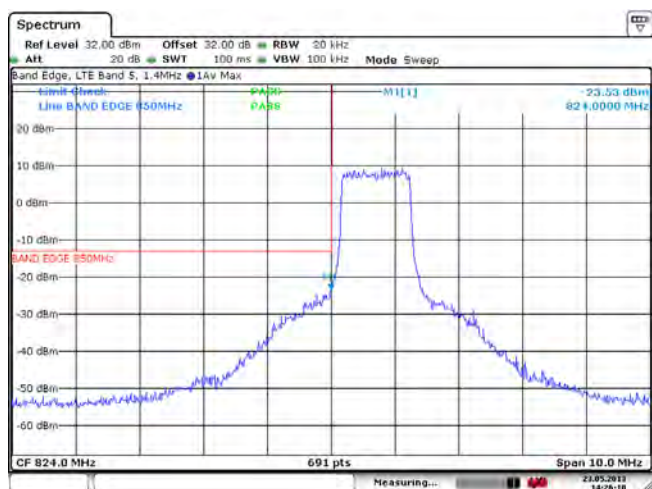
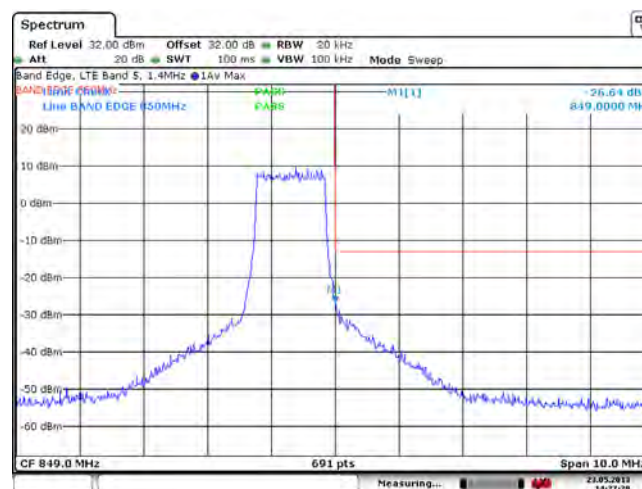


Figure 4-42a: Band 5 High Channel Mask, 1.4MHz BW, RB=6



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 4-43d: Band 5 Low Channel Mask, 10MHz BW, RB=1

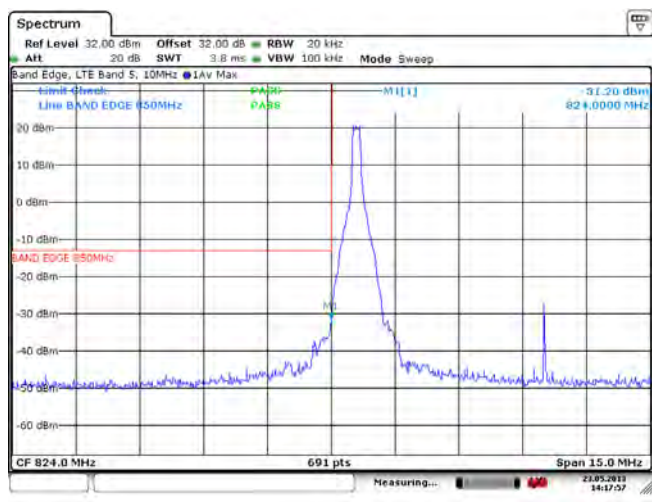
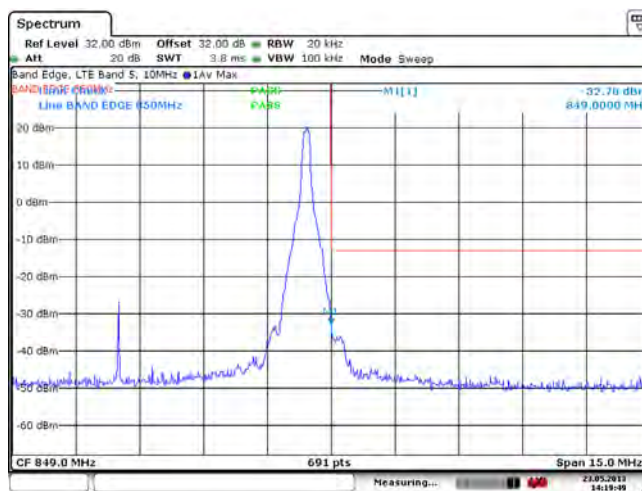


Figure 4-44a: Band 5 High Channel Mask, 10MHz BW, RB=1



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 Conducted RF Emission Test Data cont'd

Figure 3-45a: Occupied Bandwidth, Band 5 Low Channel, 10MHz BW (RB= 50) 16-QAM

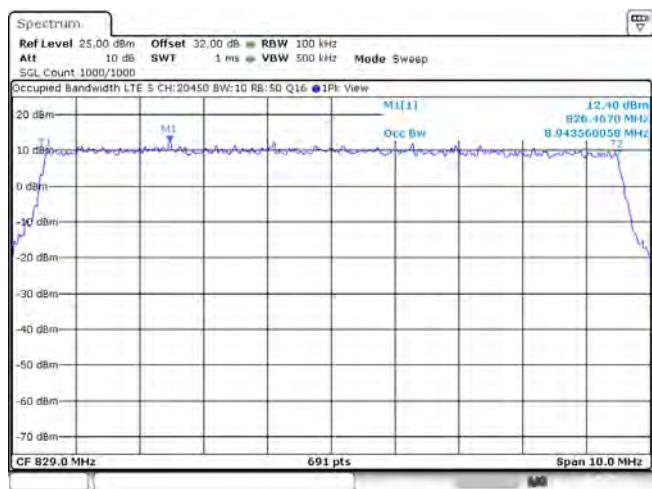


Figure 3-46a: Occupied Bandwidth, Band 5 Mid Channel, 20MHz BW (RB= 50) 16-QAM

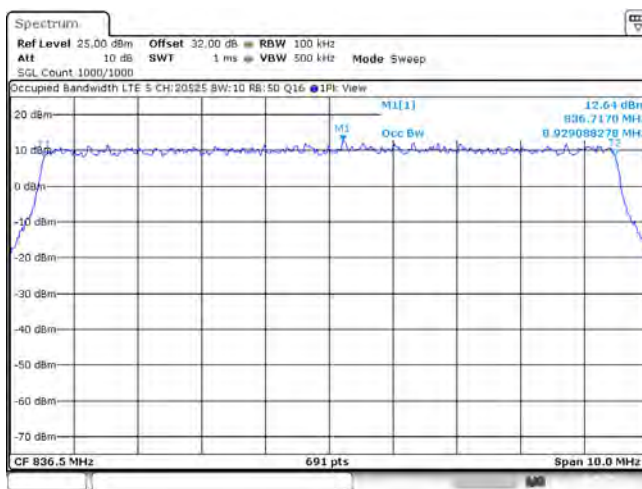
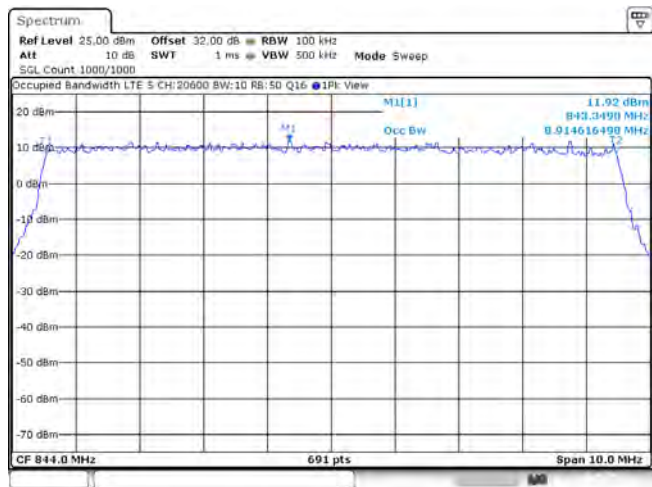


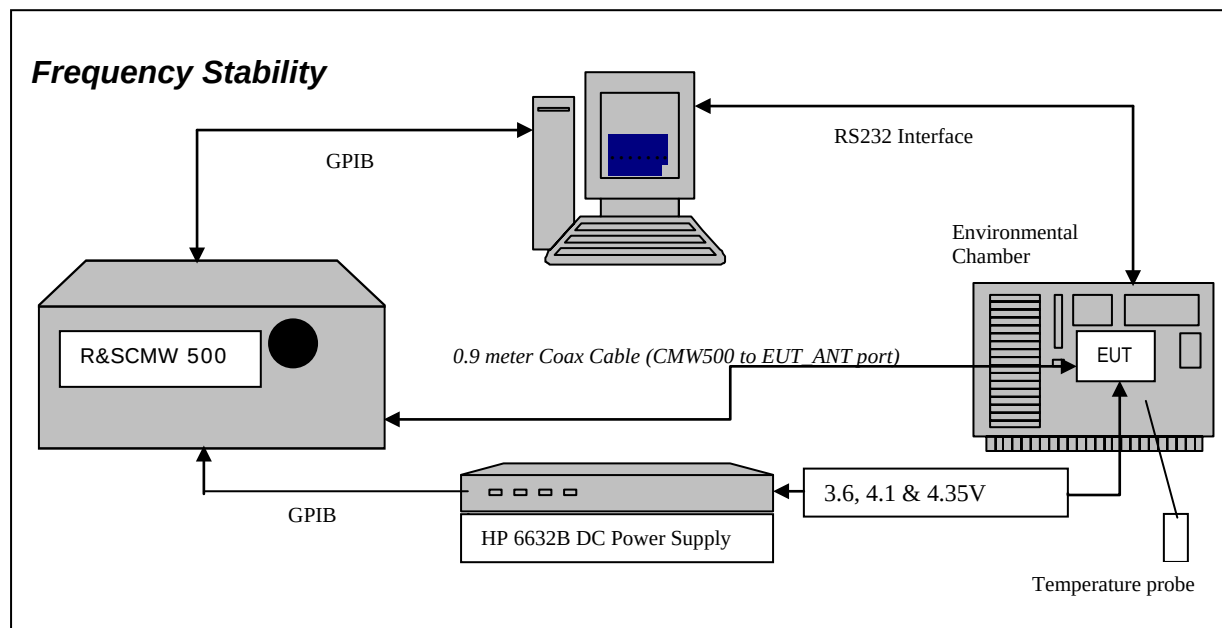
Figure 3-47a: Occupied Bandwidth, Band 5 High Channel, 10MHz BW (RB= 50) 16-QAM



APPENDIX 4B – LTE Band 5 FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 5 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

24.237 Frequency Stability.

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

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 27.54, CFR 47 and RSS-139, 6.3 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMW 500 and the EUT antenna port.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 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 CMW 500 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 829.0 MHz, 836.5 MHz and 844.0 MHz each was measured under 10 MHz bandwidth with maximum (50) resource blocks. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Procedure:

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

- Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
- Start test program
- Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
- Set power supply voltage to 3.6 volts.
- Set up CMW 500 Radio Communication Tester.
- Command the CMW 500 to switch to the low channel.
- Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
- EUT is commanded to Transmit 100 Bursts.
- Software logs the following data from the CMW 500, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
- The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
- Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
- Increase temperature by 10°C and soak for 1/2 hour.
- Repeat steps 4 - 12 for temperatures –30°C to 60°C.
- 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 LTE Band 5 measured was **0.0208 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Date of test: May 23, 2013

LTE Band 5 results: channels 20400, 20525 and 20649 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	3.6	20	11.46	0.0138
20525	836.5	3.6	20	12.71	0.0152
20600	844.0	3.6	20	7.08	0.0084

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	20	5.83	0.0070
20525	836.5	4.1	20	1.41	0.0017
20600	844.0	4.1	20	9.63	0.0114

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	20	14.67	0.0177
20525	836.5	4.35	20	11.39	0.0136
20600	844.0	4.35	20	10.53	0.0125

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 5 Results: channel 20400 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	3.6	-30	10.56	0.0127
20450	829.0	3.6	-20	1.05	0.0013
20450	829.0	3.6	-10	-12.92	-0.0156
20450	829.0	3.6	0	6.55	0.0079
20450	829.0	3.6	10	14.23	0.0172
20450	829.0	3.6	20	11.46	0.0138
20450	829.0	3.6	30	5.21	0.0063
20450	829.0	3.6	40	-7.66	-0.0092
20450	829.0	3.6	50	17.27	0.0208
20450	829.0	3.6	60	12.32	0.0149
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	-30	3.31	0.0040
20450	829.0	4.1	-20	2.91	0.0035
20450	829.0	4.1	-10	-12.99	-0.0157
20450	829.0	4.1	0	6.02	0.0073
20450	829.0	4.1	10	13.44	0.0162
20450	829.0	4.1	20	5.83	0.0070
20450	829.0	4.1	30	6.33	0.0076
20450	829.0	4.1	40	0.54	0.0007
20450	829.0	4.1	50	9.41	0.0114
20450	829.0	4.1	60	3.65	0.0044
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	-30	0.61	0.0007
20450	829.0	4.35	-20	-10.81	-0.0130
20450	829.0	4.35	-10	14.00	0.0169
20450	829.0	4.35	0	1.70	0.0021
20450	829.0	4.35	10	11.59	0.0140
20450	829.0	4.35	20	14.67	0.0177
20450	829.0	4.35	30	16.98	0.0205
20450	829.0	4.35	40	2.70	0.0033
20450	829.0	4.35	50	5.38	0.0065
20450	829.0	4.35	60	13.19	0.0159

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

LTE band 5 Results: channel 20525 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	3.6	-30	14.17	0.0169
20525	836.5	3.6	-20	1.59	0.0019
20525	836.5	3.6	-10	10.15	0.0121
20525	836.5	3.6	0	13.17	0.0157
20525	836.5	3.6	10	-2.60	-0.0031
20525	836.5	3.6	20	12.71	0.0152
20525	836.5	3.6	30	2.41	0.0029
20525	836.5	3.6	40	10.72	0.0128
20525	836.5	3.6	50	15.38	0.0184
20525	836.5	3.6	60	14.04	0.0168
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.1	-30	10.16	0.0121
20525	836.5	4.1	-20	8.95	0.0107
20525	836.5	4.1	-10	15.07	0.0180
20525	836.5	4.1	0	9.12	0.0109
20525	836.5	4.1	10	-1.79	-0.0021
20525	836.5	4.1	20	1.41	0.0017
20525	836.5	4.1	30	4.13	0.0049
20525	836.5	4.1	40	7.87	0.0094
20525	836.5	4.1	50	11.72	0.0140
20525	836.5	4.1	60	-5.61	-0.0067
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.35	-30	4.94	0.0059
20525	836.5	4.35	-20	6.16	0.0074
20525	836.5	4.35	-10	8.29	0.0099
20525	836.5	4.35	0	8.22	0.0098
20525	836.5	4.35	10	3.16	0.0038
20525	836.5	4.35	20	11.39	0.0136
20525	836.5	4.35	30	10.70	0.0128
20525	836.5	4.35	40	11.34	0.0136
20525	836.5	4.35	50	8.92	0.0107
20525	836.5	4.35	60	10.37	0.0124

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 5 Results: channel 20649 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	3.6	-30	9.28	0.0110
20600	844.0	3.6	-20	11.42	0.0135
20600	844.0	3.6	-10	5.32	0.0063
20600	844.0	3.6	0	10.42	0.0123
20600	844.0	3.6	10	-8.50	-0.0101
20600	844.0	3.6	20	7.08	0.0084
20600	844.0	3.6	30	8.87	0.0105
20600	844.0	3.6	40	9.13	0.0108
20600	844.0	3.6	50	13.62	0.0161
20600	844.0	3.6	60	12.13	0.0144
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.1	-30	7.24	0.0086
20600	844.0	4.1	-20	11.24	0.0133
20600	844.0	4.1	-10	5.40	0.0064
20600	844.0	4.1	0	10.98	0.0130
20600	844.0	4.1	10	6.35	0.0075
20600	844.0	4.1	20	9.63	0.0114
20600	844.0	4.1	30	6.52	0.0077
20600	844.0	4.1	40	2.47	0.0029
20600	844.0	4.1	50	5.61	0.0066
20600	844.0	4.1	60	10.20	0.0121
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.35	-30	12.09	0.0143
20600	844.0	4.35	-20	12.62	0.0150
20600	844.0	4.35	-10	17.85	0.0212
20600	844.0	4.35	0	9.65	0.0114
20600	844.0	4.35	10	11.86	0.0141
20600	844.0	4.35	20	10.53	0.0125
20600	844.0	4.35	30	8.68	0.0103
20600	844.0	4.35	40	13.99	0.0166
20600	844.0	4.35	50	8.58	0.0102
20600	844.0	4.35	60	13.56	0.0161

APPENDIX 4C – LTE Band 5 RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 4C			
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW	

Radiated Emissions Test Data Results cont'd

Date of Test: May 15, 2013

The following measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 24.3 °C
 Relative Humidity: 34.5 %

The BlackBerry® smartphone was standalone, with USB jack pointing up and LCD facing 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 LTE band 5 with QPSK modulation for 1.4MHz BW (channel 20407, 20525 and 20642 with RB = 1), 5MHz BW (channel 20425, 20525 and 20624 with RB = 1) and 10MHz BW (channel 20500, 20525, 20549 with RB = 50 and RB = 1) and with 16-QAM modulation for 1.4MHz BW (channel 20525 with RB = 1), 5MHz BW (channel 20525 with RB = 1) and 10MHz BW (channel 20525 with RB = 50 and RB = 1).

All emissions were at least 25 dB below the limit.

Date of Test: May 17, 2013

The following measurements were performed by Shuo Wang

The environmental test conditions were: Temperature: 27.8 °C
 Relative Humidity: 27.5 %

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 10 GHz.

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

Measurements were performed in LTE band 5 with QPSK modulation for 1.4MHz BW (channel 20407, 20525 and 20642 with RB = 1), 5MHz BW (channel 20425, 20525 and 20624 with RB = 1) and 10MHz BW (channel 20500, 20525, 20549 with RB = 50 and RB = 1) and with 16-QAM modulation for 1.4MHz BW (channel 20525 with RB = 1), 5MHz BW (channel 20525 with RB = 1) and 10MHz BW (channel 20525 with RB = 50 and RB = 1).

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)							
8360.42	20525	V	4.00	176	PK	39.70	-75.46	-35.76	-13.00	-22.8

All other emissions were at least 25 dB below the limit.

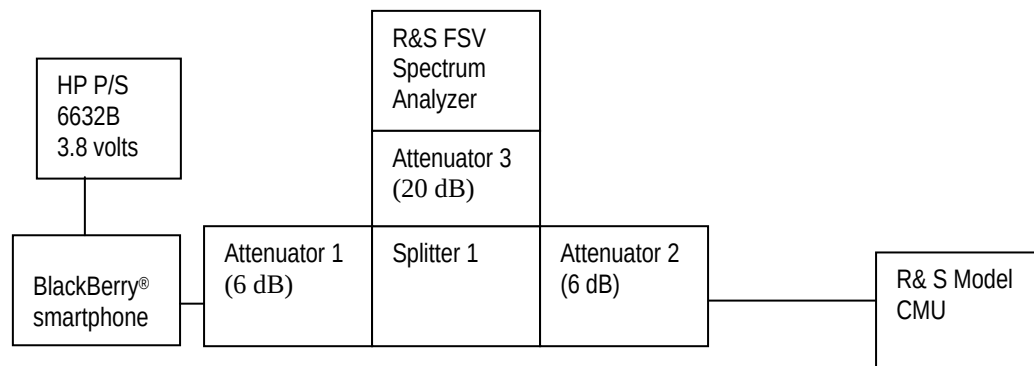
APPENDIX 5A – LTE Band 4 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

LTE Band 4 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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: May 15 and May 30, 2013

The environmental test conditions were: Temperature: 24.2°C
Relative Humidity: 44.6 %

The following measurements were performed by Berkin Can.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Emission Designator Table

LTE Band 4 Frequency (MHz)	Conducted Output Power (dBm)	RB Size	RB Offset	Emission Designator	RB Size	RB Offset	Band	Bandwidth (MHz)	Modulation
1710.7	22.55	1	0	1M08G7D	6	0	LTE B4	1.4	QPSK
1732.5	21.47	1	3	1M09D7W	6	0	LTE B4	1.4	16QAM
1711.5	22.55	1	0	2M68G7D	15	0	LTE B4	3	QPSK
1711.5	21.8	1	0	2M68D7W	15	0	LTE B4	3	16QAM
1712.5	22.62	1	0	4M50G7D	25	0	LTE B4	5	QPSK
1712.5	22.13	1	0	4M50D7W	25	0	LTE B4	5	16QAM
1732.5	22.61	1	25	8M92G7D	50	0	LTE B4	10	QPSK
1715	22.13	1	0	8M95D7W	50	0	LTE B4	10	16QAM
1747.5	22.51	1	74	13M4G7D	75	0	LTE B4	15	QPSK
1717.5	21.44	1	0	13M4D7W	75	0	LTE B4	15	16QAM
1745	22.71	1	99	17M9G7D	100	0	LTE B4	20	QPSK
1732.5	21.48	1	50	17M9D7W	100	0	LTE B4	20	16QAM

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 27.53, RSS-139, 6.5 were measured from 30 MHz to 20 GHz.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

The modulation spectrum was measured by both methods of 99% power bandwidth and – 26 dBc bandwidth For each 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz with different number of resource blocks for LTE band 4,.

QPSK and 16-QAM modulations were applied to each of the bandwidths. Only the worst case measurements are documented in this report.

A minimum resource block condition was also measured (RB = 1).

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 LTE band 4 was measured to be 18.726 MHz. Results were derived in a 200 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Data for LTE Band 4 selected Frequencies in 20MHz BW (RB = 100)

LTE Band 4 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	QPSK	16-QAM
1720.0	18.582	17.829	17.887
1732.5	18.698	17.887	17.858
1745.0	18.726	17.887	17.887

Peak to Average Ratio (PAR)

For each 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz with different number of resource blocks as per scalable bandwidths for LTE band 4, the peak to average ratio was measured on the low, middle and high channels with QPSK modulation.

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 10.02 dB in 20MHz bandwidth with 50 resource blocks.

Measurement Plots for LTE Band 4

See Figures 5-1a to 5-18a for the plots of the conducted spurious emissions.

See Figures 5-19a to 5-34a and 5-51a to 5-53a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

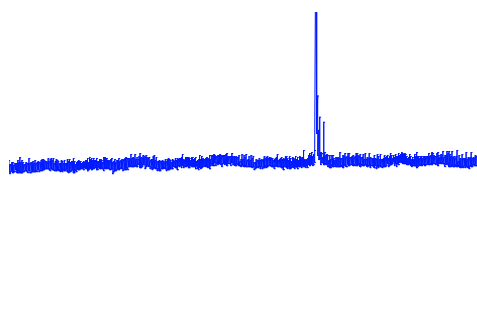
See Figures 5-35a to 5-44a for the plots of the Channel mask.

See Figures 5-45a to 5-50a for the plots of the Peak to Average Ratios.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

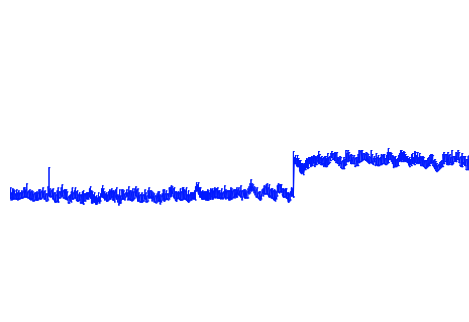
LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-1a: Band 4, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 1)



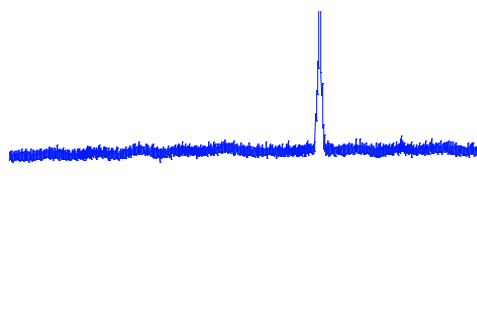
Date: 30.MAY.2013 13:22:37

Figure 5-2a: Band 4, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 1)



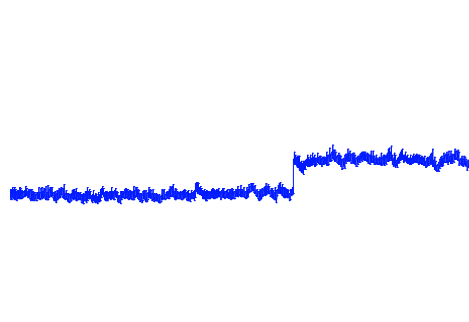
Date: 30.MAY.2013 13:23:23

Figure 5-3a: Band 4, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 50)



Date: 30.MAY.2013 13:24:16

Figure 5-4a: Band 4, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 50)

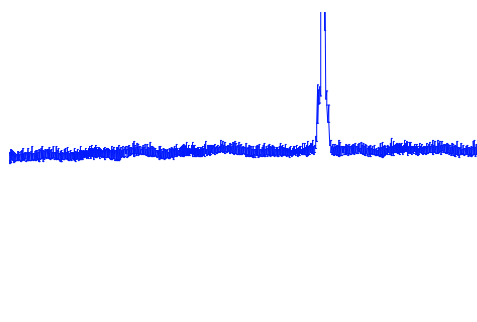


Date: 30.MAY.2013 13:25:02

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

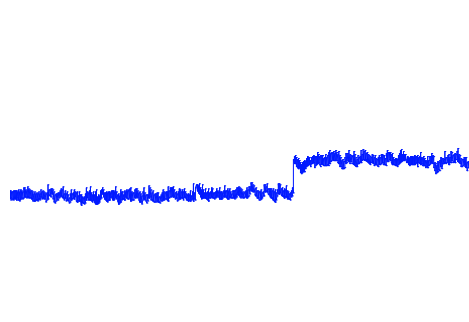
LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-5a: Band 4, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)



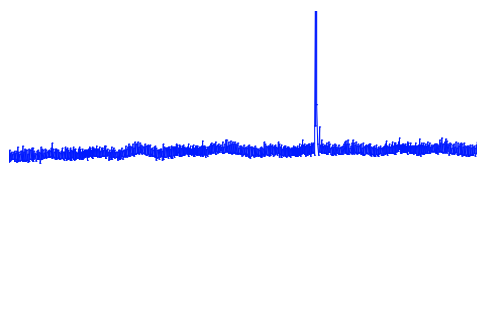
Date: 30.MAY.2013 13:25:54

Figure 5-6a: Band 4, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)



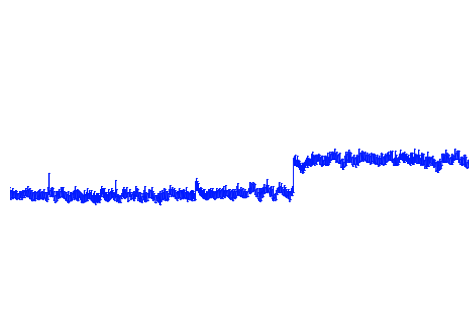
Date: 30.MAY.2013 13:26:40

Figure 5-7a: Band 4, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)



Date: 30.MAY.2013 13:27:33

Figure 5-8a: Band 4, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)

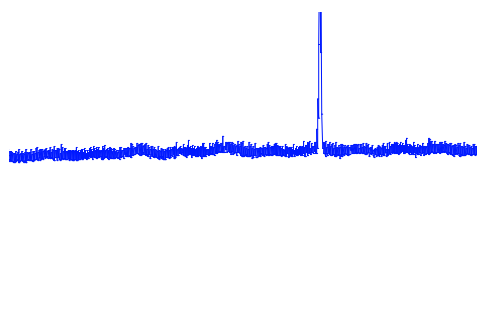


Date: 30.MAY.2013 13:28:19

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

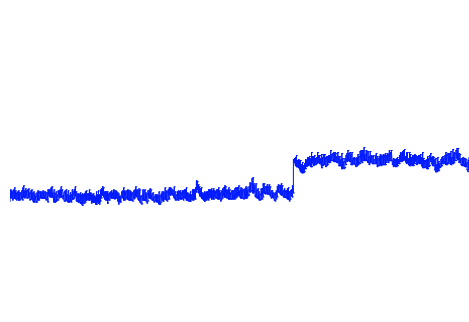
LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-9a: Band 4, Spurious Conducted Emissions, Middle Channel, 10MHz BW (RB= 25)



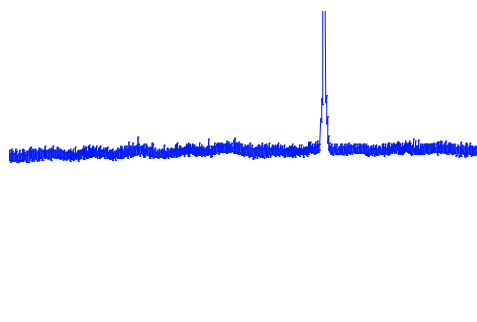
Date: 30.MAY.2013 13:29:12

Figure 5-10a: Band 4, Spurious Conducted Emissions, Middle Channel, 10MHz BW (RB= 25)



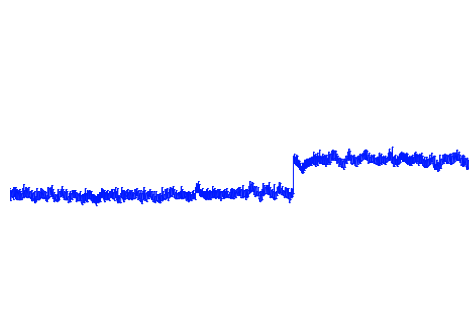
Date: 30.MAY.2013 13:29:58

Figure 5-11a: Band 4, Spurious Conducted Emissions, High channel, 10MHz BW (RB= 50)



Date: 30.MAY.2013 13:30:52

Figure 5-12a: Band 4, Spurious Conducted Emissions, High channel, 10MHz BW (RB= 50)

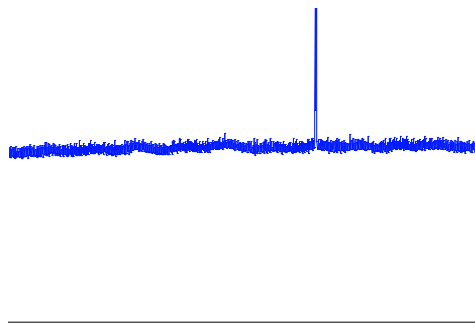


Date: 30.MAY.2013 13:31:38

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

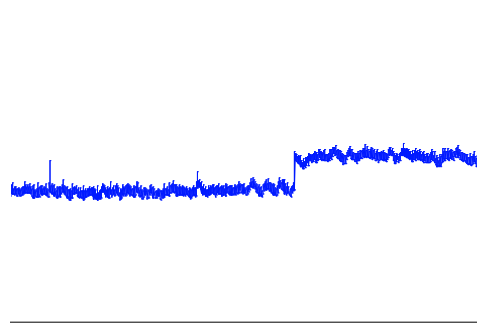
LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-13a: Band 4, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)



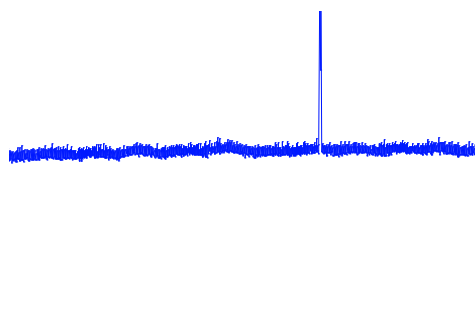
Date: 30.MAY.2013 13:33:26

Figure 5-14a: Band 4, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)



Date: 30.MAY.2013 13:34:12

Figure 5-15a: Band 4, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 3)



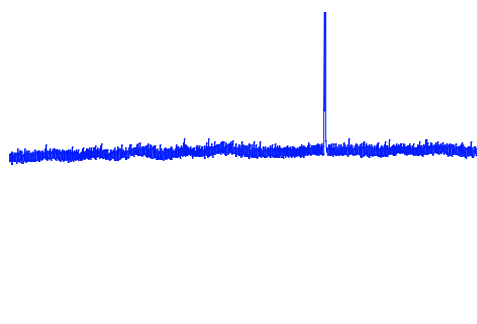
Date: 30.MAY.2013 13:35:04

Figure 5-16a: Band 4, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 3)

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

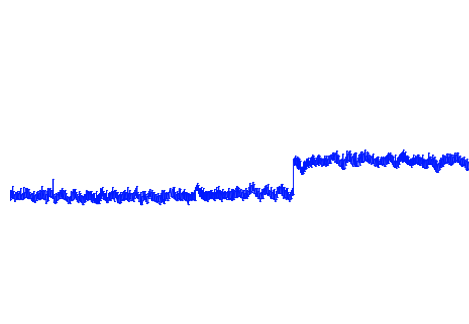
LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-17a: Band 4, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)



Date: 30.MAY.2013 13:36:44

Figure 5-18a: Band 4, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)



Date: 30.MAY.2013 13:37:30

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-19a: Occupied Bandwidth, Band 4 Low Channel, 20MHz BW, RB=100

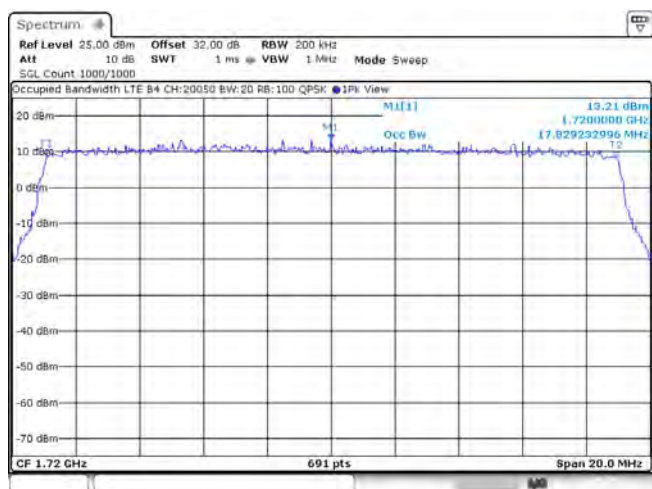


Figure 5-20a: Occupied Bandwidth, Band 4 Middle Channel, 20MHz BW, RB=100

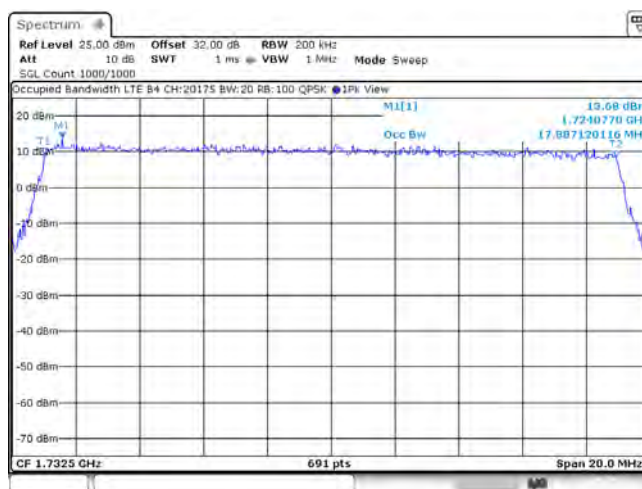
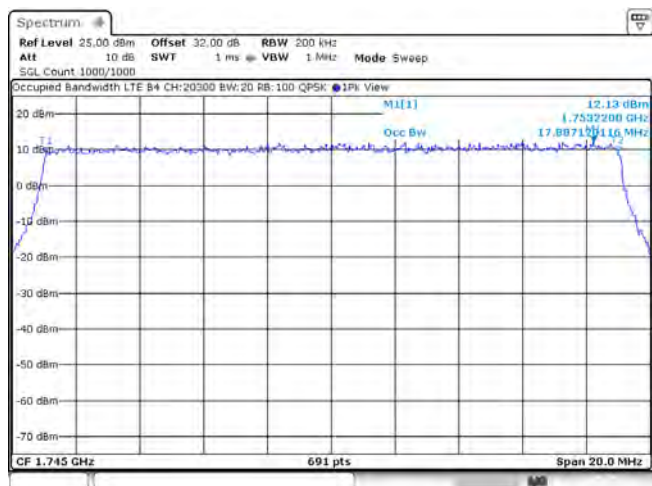


Figure 5-21a: Occupied Bandwidth, Band 4 High Channel, 20MHz BW, RB=100



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-22a: Occupied Bandwidth, Band 4 Low Channel, 10MHz BW, RB=50

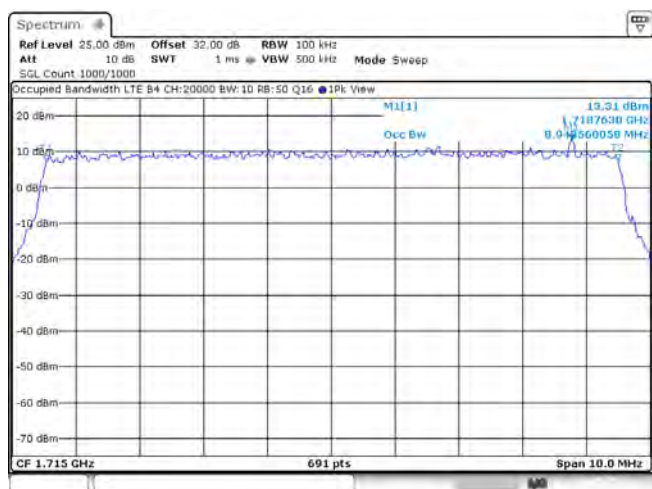


Figure 5-23a: Occupied Bandwidth, Band Middle Channel, 10MHz BW, RB=50

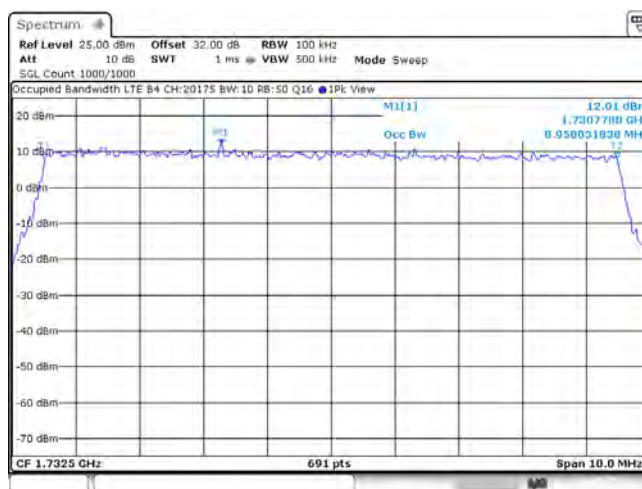
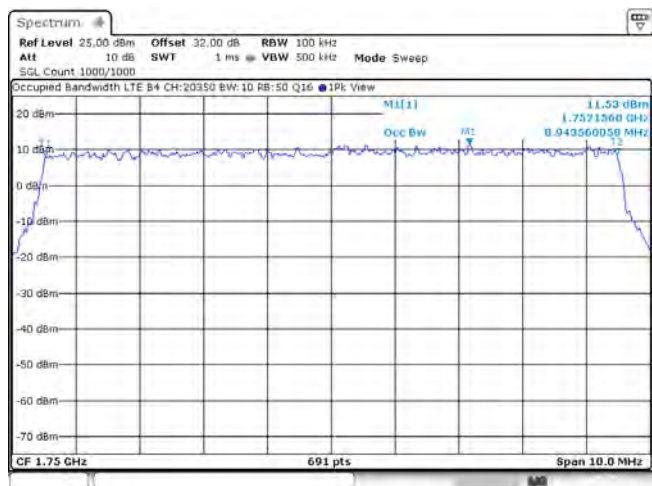


Figure 5-24a: Occupied Bandwidth, Band 4 High Channel, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-25a: Occupied Bandwidth, Band 4 Low Channel, 1.4MHz BW, RB=6

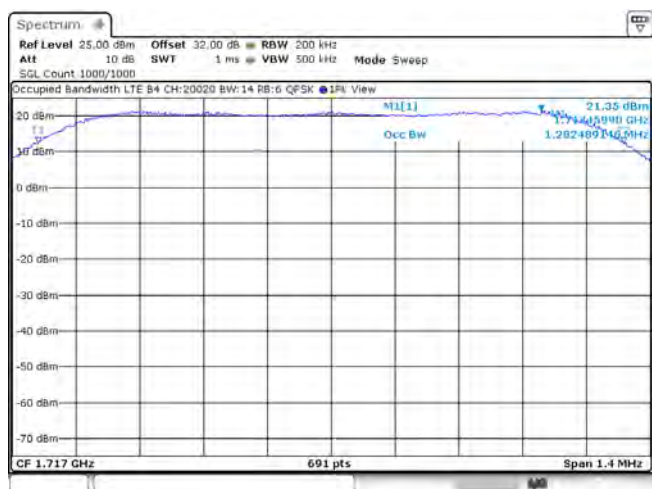


Figure 5-26a: Occupied Bandwidth, Band 4 Middle Channel, 1.4MHz BW, RB=6

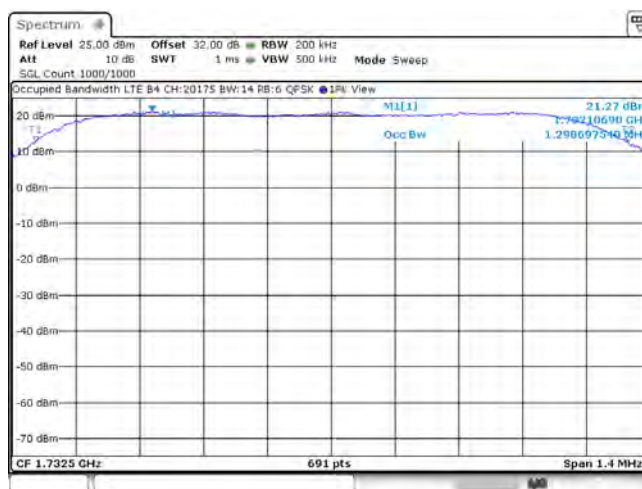
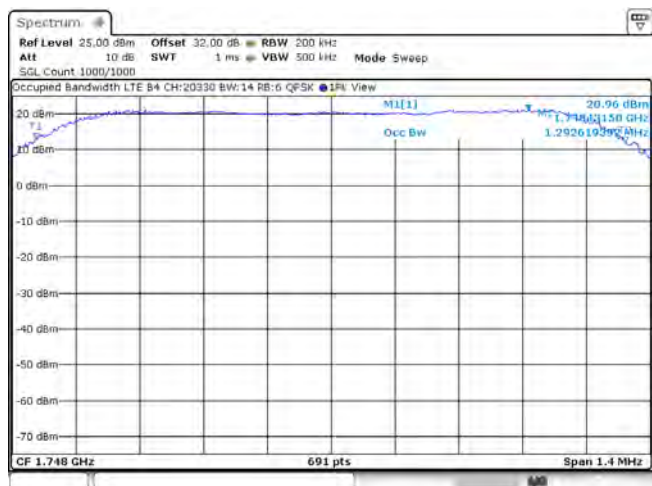


Figure 5-27a: Occupied Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-28a: -26 dBc Bandwidth, Band 4 Low Channel, 20MHz BW, RB=100

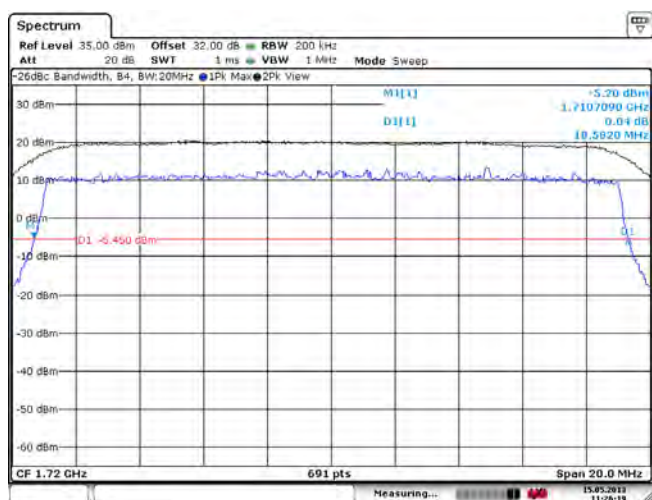


Figure 5-29a: -26 dBc Bandwidth, Band 4 Middle Channel, 20MHz BW, RB=100

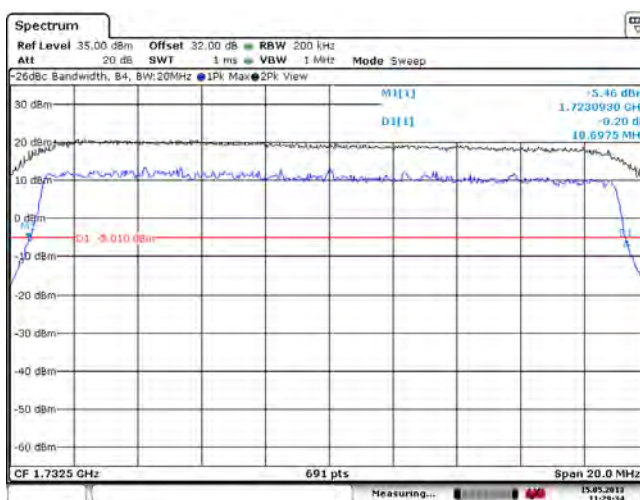


Figure 5-30a: -26 dBc Bandwidth, Band 4 High Channel, 20MHz BW, RB=100

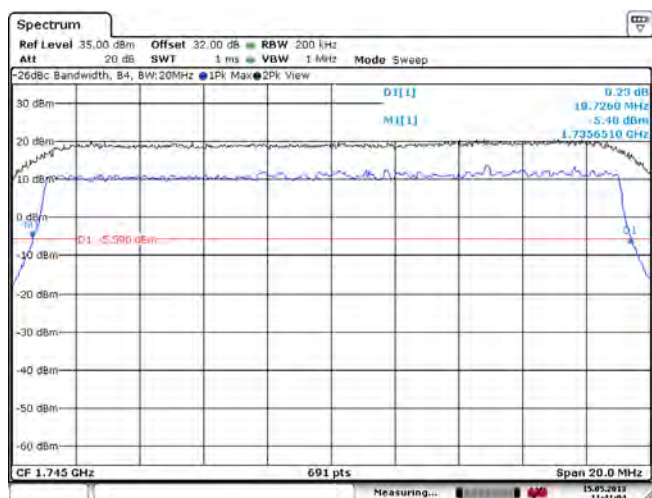
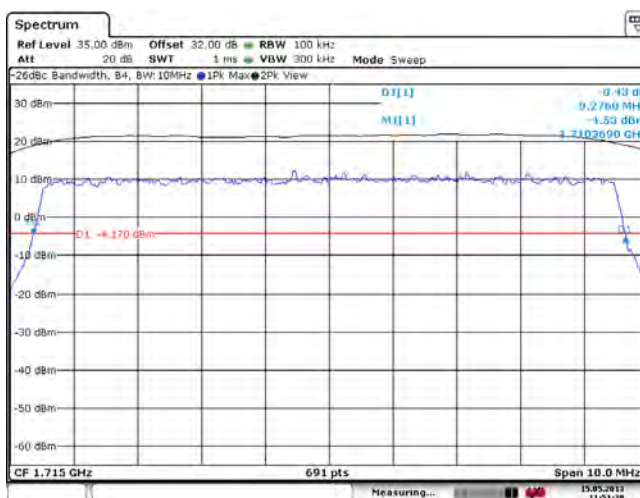


Figure 5-31a: -26 dBc Bandwidth, Band 4 Low Channel, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-32a: -26 dBc Bandwidth, Band 4 Middle Channel, 10MHz BW, RB=50

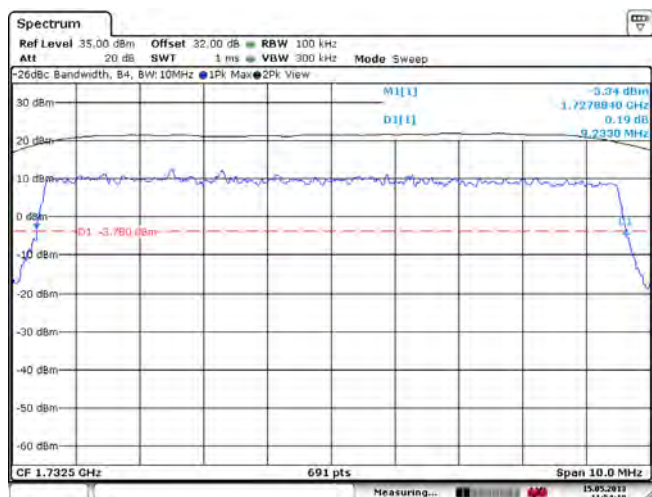


Figure 5-33a: -26 dBc Bandwidth, Band 4 High Channel, 10MHz BW, RB=50

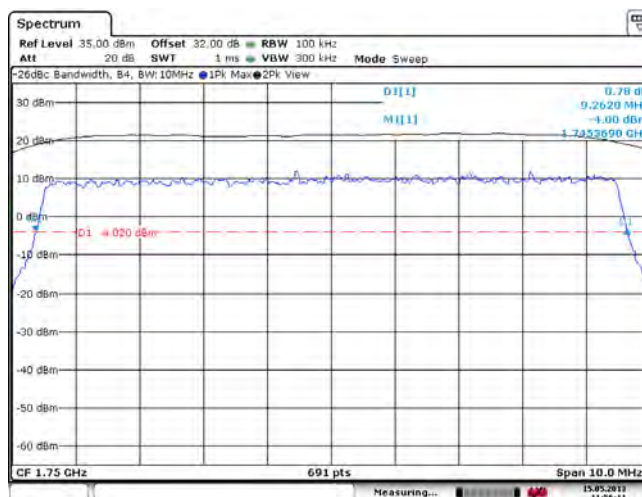


Figure 5-34a: -26 dBc Bandwidth, Band 4 Low Channel, 1.4MHz BW, RB=6

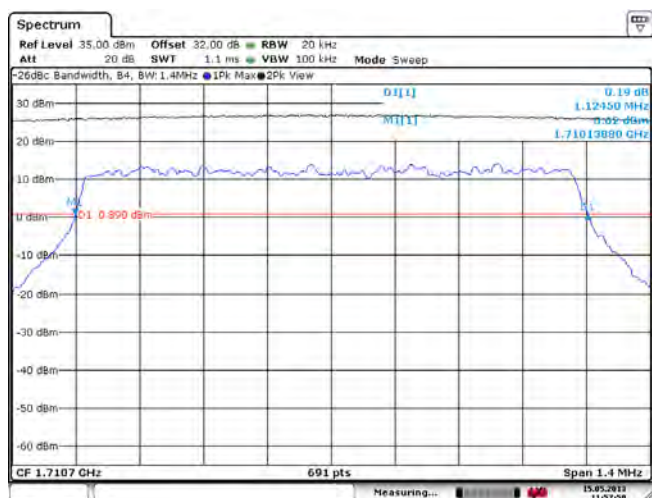
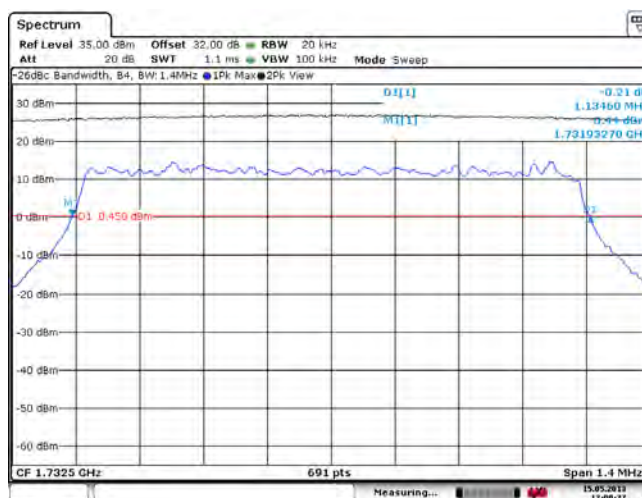


Figure 5-35a: -26 dBc Bandwidth, Band 4 Middle Channel, 1.4MHz BW, RB=6



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-36a: -26 dBc Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6

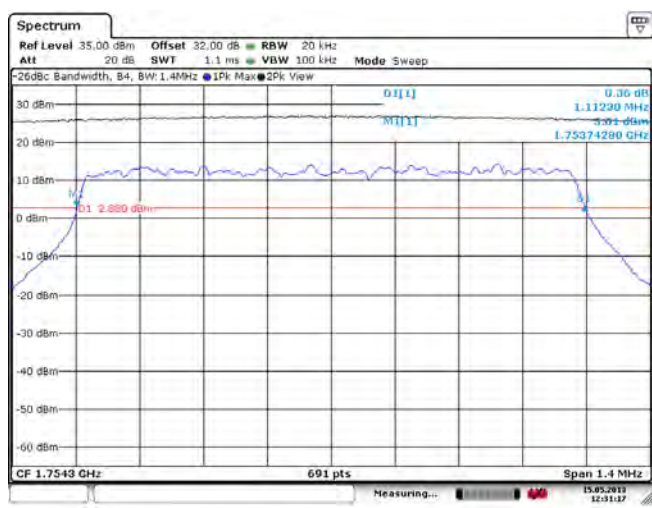


Figure 5-37a: Band 4 Low Channel Mask, 20MHz BW, RB=100

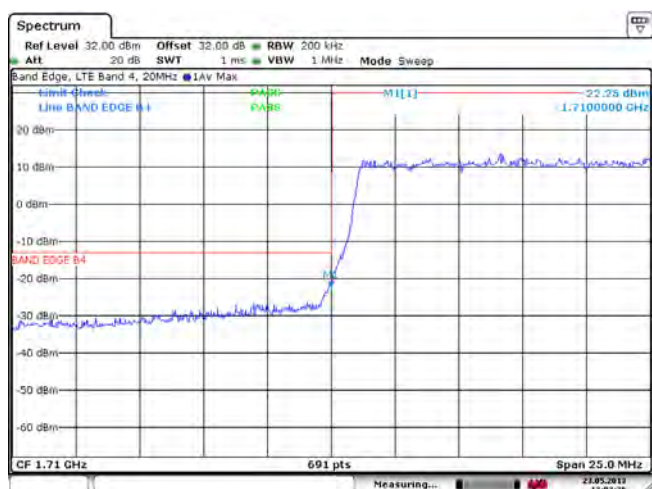
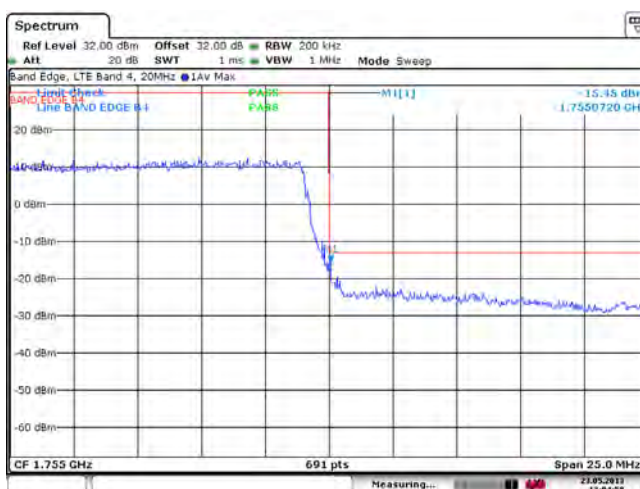


Figure 5-38a: Band 4 High Channel Mask, 20MHz BW, RB=100



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-39a: Band 4 Low Channel Mask, 10MHz BW, RB=50

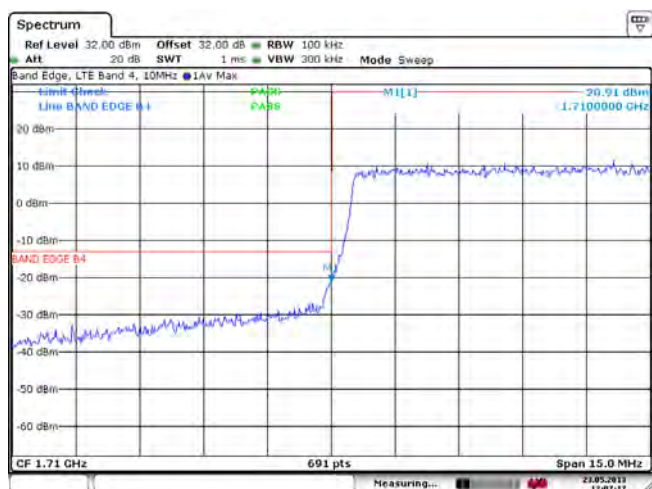


Figure 5-40a: Band 4 High Channel Mask, 10MHz BW, RB=50

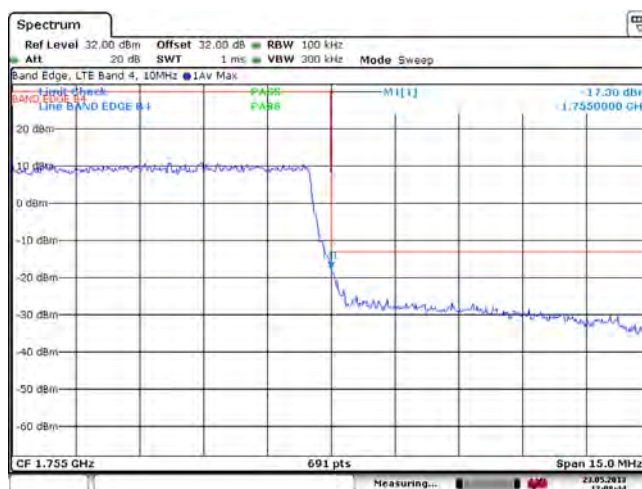


Figure 5-41a: Band 4 Low Channel Mask, 1.4MHz BW, RB=6

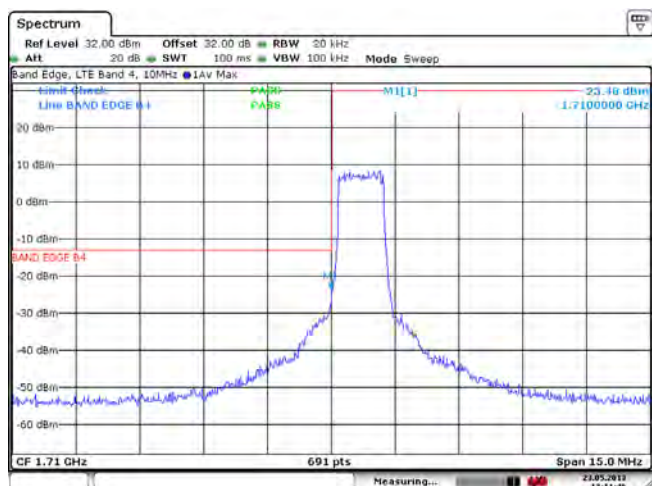
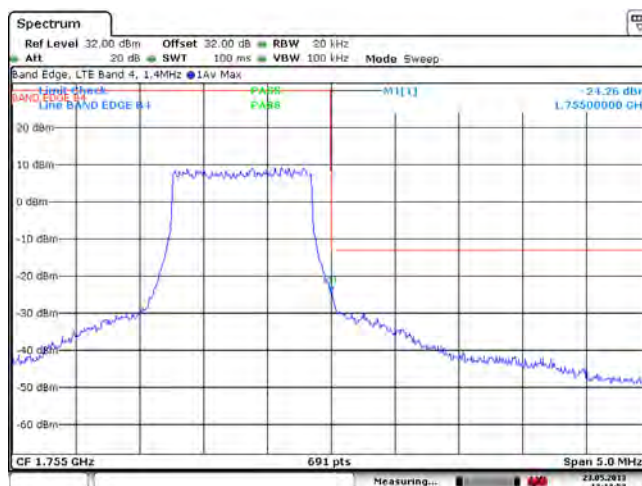


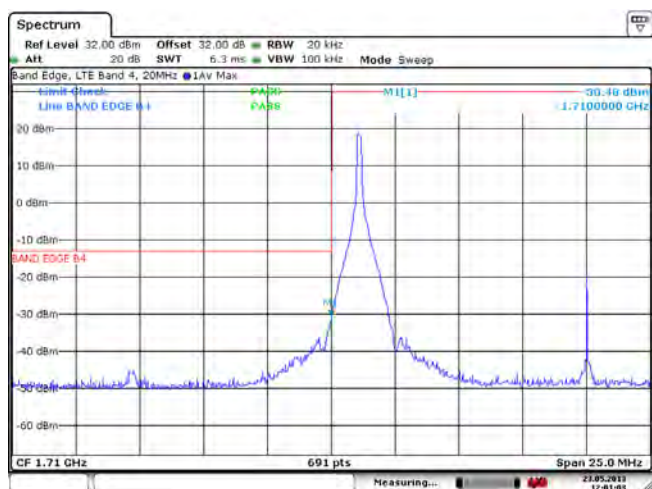
Figure 5-42a: Band 4 High Channel Mask, 1.4MHz BW, RB=6



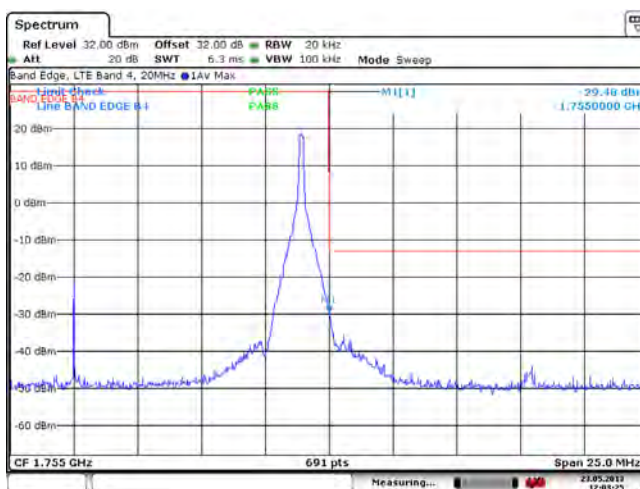
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

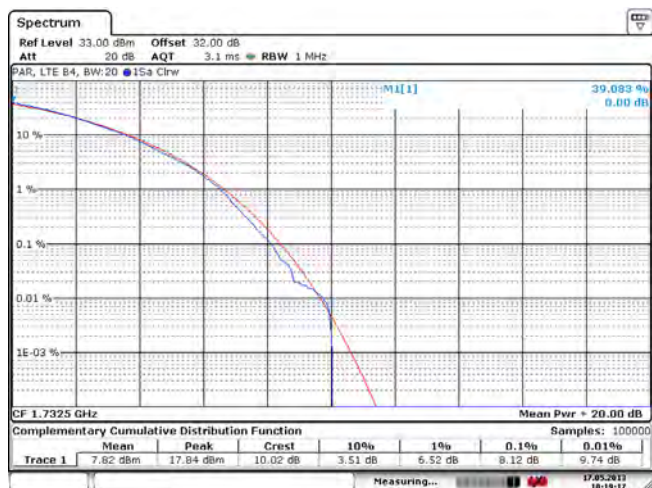
**Figure 5-43a: Band 4 Low Channel Mask, 20MHz
BW, RB=1**



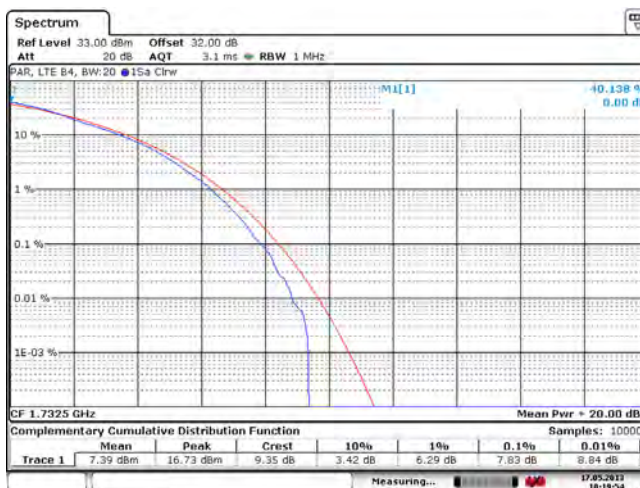
**Figure 5-44a: Band 4 High Channel Mask, 20MHz
BW, RB=1**



**Figure 5-45a: Band 4 Mid Channel PAR, 20MHz
BW, RB=50, QPSK**



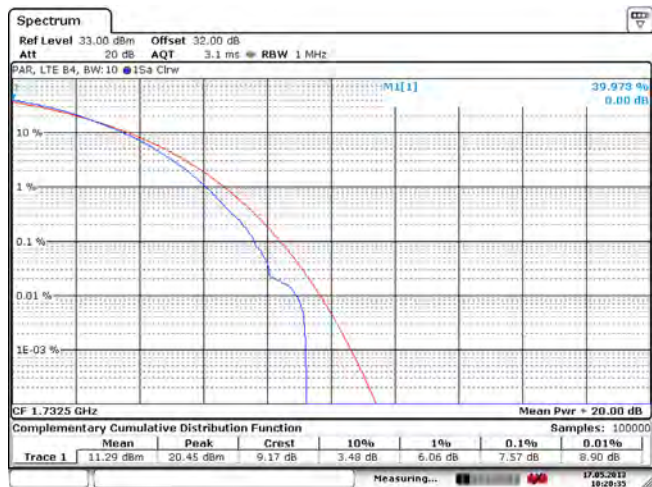
**Figure 5-46a: Band 4 Middle Channel Mask, 20MHz
BW, RB=100, 16-QAM**



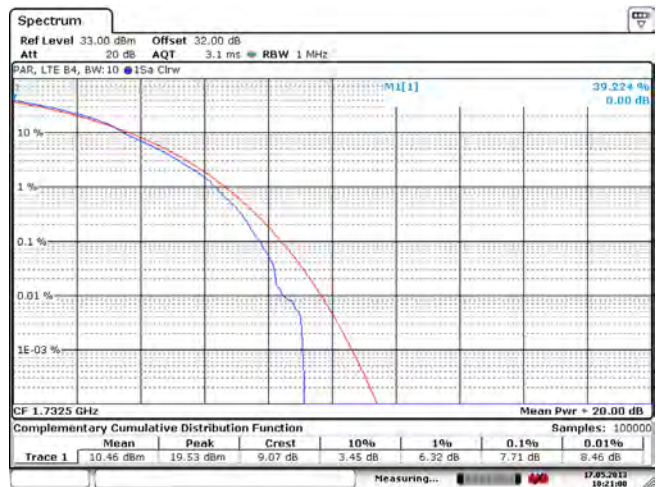
	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

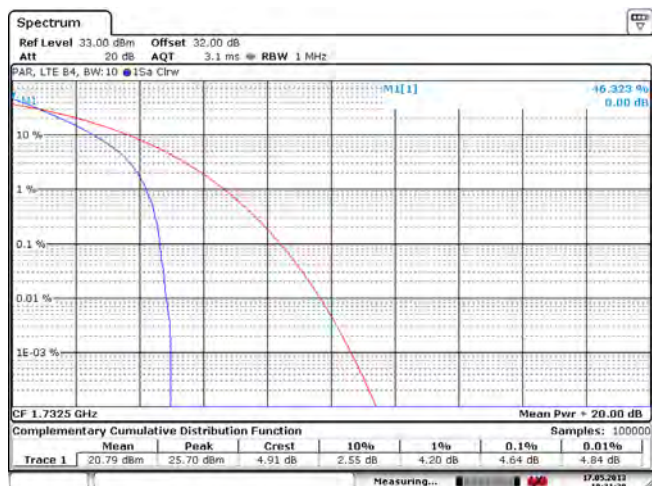
**Figure 5-47a: Band 4 Mid Channel PAR, 10MHz
BW, RB=25, QPSK**



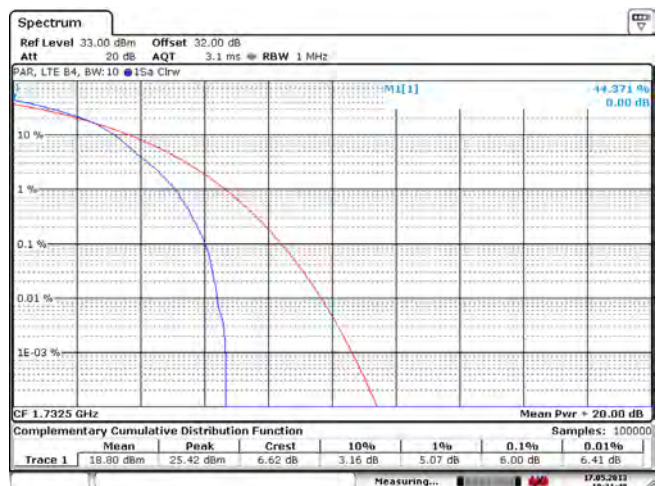
**Figure 5-48a: Band 4 Mid Channel PAR, 10MHz
BW, RB=50, 16-QAM**



**Figure 5-49a: Band 4 Mid Channel PAR, 1.4MHz
BW, RB=3, QPSK**



**Figure 5-50a: Band 4 Middle Channel Mask, 5MHz
BW, RB=6, 16-QAM**



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 Conducted RF Emission Test Data cont'd

Figure 5-51a: Occupied Bandwidth, Band 4 Low Channel, 20MHz BW (RB= 100) 16-QAM

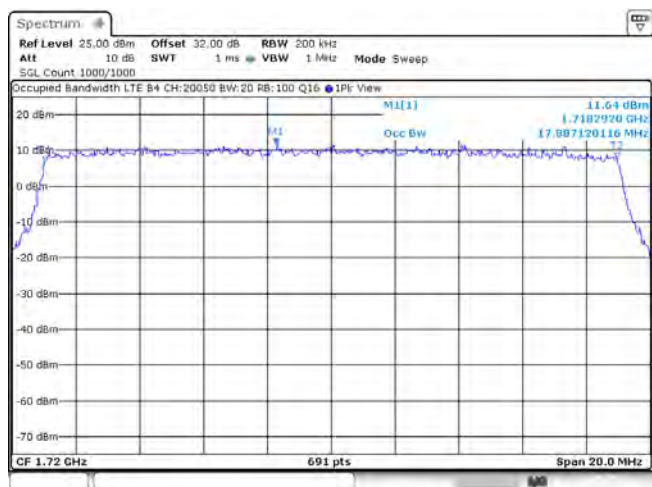


Figure 5-52a: Occupied Bandwidth, Band 4 Mid Channel, 20MHz BW (RB= 100) 16-QAM

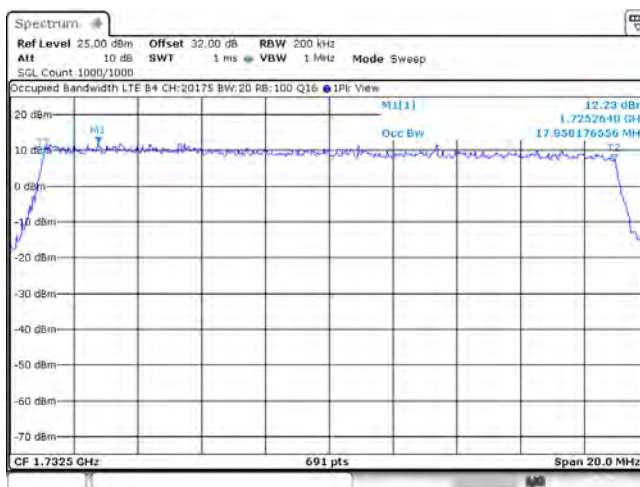
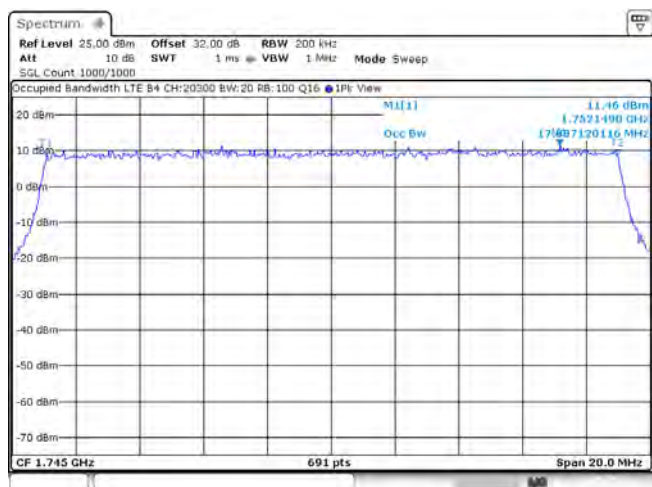


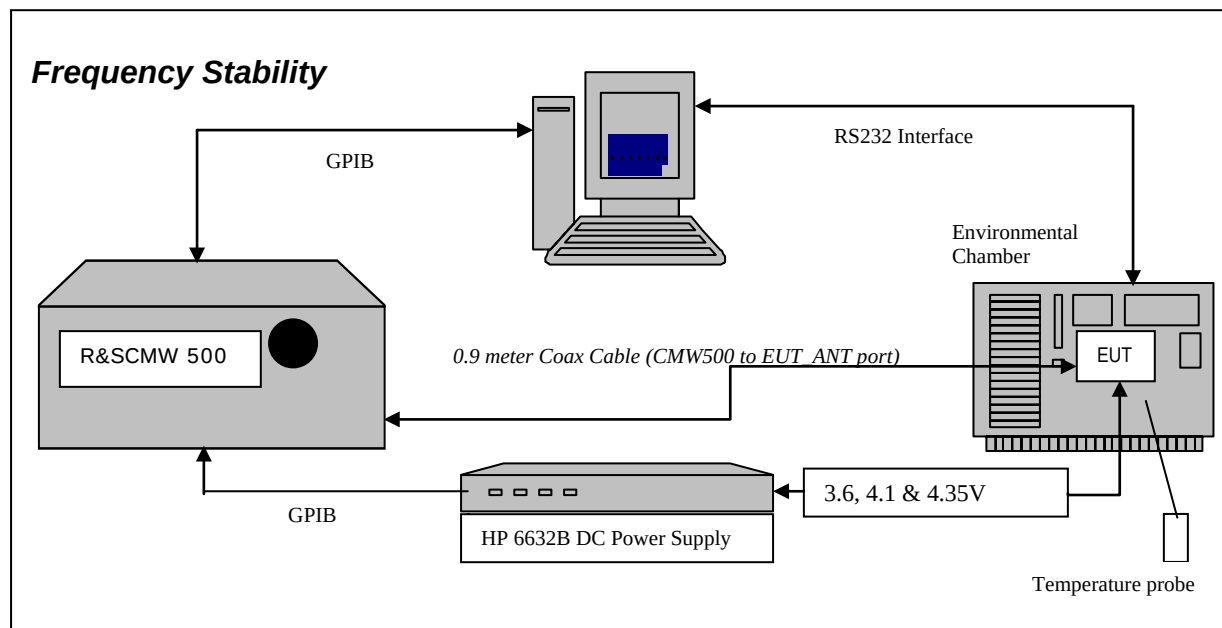
Figure 5-53a: Occupied Bandwidth, Band 4 High Channel, 20MHz BW (RB= 100) 16-QAM



APPENDIX 5B – LTE Band 4 FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 4 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

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 27.54, CFR 47 and RSS-139, 6.3 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMW 500 and the EUT antenna port.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 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 CMW 500 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 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 1720.0 MHz, 1732.5 MHz and 1745.0 MHz each was measured under 20 MHz bandwidth with maximum (100) resource blocks. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Procedure:

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

- Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
- Start test program
- Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
- Set power supply voltage to 3.6 volts.
- Set up CMW 500 Radio Communication Tester.
- Command the CMW 500 to switch to the low channel.
- Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
- EUT is commanded to Transmit 100 Bursts.
- Software logs the following data from the CMW 500, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
- The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
- Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
- Increase temperature by 10°C and soak for 1/2 hour.
- Repeat steps 4 - 12 for temperatures –30°C to 60°C.
- 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 LTE band 4 measured was **0.0234 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Date of test: May 23, 2013

LTE Band 4 results: channels 20050, 20175 and 20300 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	3.6	20	18.21	0.0106
20175	1732.5	3.6	20	5.68	0.0033
20300	1745.0	3.6	20	17.33	0.0099

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	20	18.84	0.0110
20175	1732.5	4.1	20	3.19	0.0018
20300	1745.0	4.1	20	21.20	0.0121

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	20	24.22	0.0141
20175	1732.5	4.35	20	10.17	0.0059
20300	1745.0	4.35	20	5.09	0.0029

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 4 Results: channel 20050 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	3.6	-30	14.55	0.0085
20050	1720.0	3.6	-20	18.77	0.0109
20050	1720.0	3.6	-10	13.13	0.0076
20050	1720.0	3.6	0	20.59	0.0120
20050	1720.0	3.6	10	18.32	0.0107
20050	1720.0	3.6	20	18.21	0.0106
20050	1720.0	3.6	30	18.59	0.0108
20050	1720.0	3.6	40	18.61	0.0108
20050	1720.0	3.6	50	26.74	0.0155
20050	1720.0	3.6	60	18.40	0.0107
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	-30	19.49	0.0113
20050	1720.0	4.1	-20	20.10	0.0117
20050	1720.0	4.1	-10	22.76	0.0132
20050	1720.0	4.1	0	22.45	0.0131
20050	1720.0	4.1	10	25.55	0.0149
20050	1720.0	4.1	20	18.84	0.0110
20050	1720.0	4.1	30	33.10	0.0192
20050	1720.0	4.1	40	17.75	0.0103
20050	1720.0	4.1	50	12.37	0.0072
20050	1720.0	4.1	60	20.29	0.0118
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	-30	16.19	0.0094
20050	1720.0	4.35	-20	16.03	0.0093
20050	1720.0	4.35	-10	22.25	0.0129
20050	1720.0	4.35	0	18.32	0.0107
20050	1720.0	4.35	10	19.29	0.0112
20050	1720.0	4.35	20	24.22	0.0141
20050	1720.0	4.35	30	23.33	0.0136
20050	1720.0	4.35	40	17.20	0.0100
20050	1720.0	4.35	50	10.91	0.0063
20050	1720.0	4.35	60	20.61	0.0120

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 4 Results: channel 20175 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	3.6	-30	17.83	0.0103
20175	1732.5	3.6	-20	15.21	0.0088
20175	1732.5	3.6	-10	4.64	0.0027
20175	1732.5	3.6	0	7.62	0.0044
20175	1732.5	3.6	10	14.48	0.0084
20175	1732.5	3.6	20	5.68	0.0033
20175	1732.5	3.6	30	8.14	0.0047
20175	1732.5	3.6	40	-0.20	-0.0001
20175	1732.5	3.6	50	22.41	0.0129
20175	1732.5	3.6	60	10.27	0.0059
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.1	-30	6.98	0.0040
20175	1732.5	4.1	-20	9.30	0.0054
20175	1732.5	4.1	-10	17.32	0.0100
20175	1732.5	4.1	0	21.34	0.0123
20175	1732.5	4.1	10	3.53	0.0020
20175	1732.5	4.1	20	3.19	0.0018
20175	1732.5	4.1	30	4.36	0.0025
20175	1732.5	4.1	40	-0.63	-0.0004
20175	1732.5	4.1	50	17.54	0.0101
20175	1732.5	4.1	60	4.19	0.0024
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.35	-30	-0.51	-0.0003
20175	1732.5	4.35	-20	-2.23	-0.0013
20175	1732.5	4.35	-10	17.69	0.0102
20175	1732.5	4.35	0	17.42	0.0101
20175	1732.5	4.35	10	4.01	0.0023
20175	1732.5	4.35	20	10.17	0.0059
20175	1732.5	4.35	30	18.88	0.0109
20175	1732.5	4.35	40	0.06	0.0000
20175	1732.5	4.35	50	16.14	0.0093
20175	1732.5	4.35	60	11.26	0.0065

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 4 Results: channel 20300 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	3.6	-30	6.93	0.0040
20300	1745.0	3.6	-20	7.98	0.0046
20300	1745.0	3.6	-10	0.35	0.0002
20300	1745.0	3.6	0	11.88	0.0068
20300	1745.0	3.6	10	3.23	0.0019
20300	1745.0	3.6	20	17.33	0.0099
20300	1745.0	3.6	30	40.90	0.0234
20300	1745.0	3.6	40	1.54	0.0009
20300	1745.0	3.6	50	23.80	0.0136
20300	1745.0	3.6	60	6.83	0.0039
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.1	-30	-3.72	-0.0021
20300	1745.0	4.1	-20	22.51	0.0129
20300	1745.0	4.1	-10	-2.80	-0.0016
20300	1745.0	4.1	0	4.09	0.0023
20300	1745.0	4.1	10	17.06	0.0098
20300	1745.0	4.1	20	21.20	0.0121
20300	1745.0	4.1	30	1.43	0.0008
20300	1745.0	4.1	40	22.74	0.0130
20300	1745.0	4.1	50	5.31	0.0030
20300	1745.0	4.1	60	2.40	0.0014
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.35	-30	19.97	0.0114
20300	1745.0	4.35	-20	18.44	0.0106
20300	1745.0	4.35	-10	11.31	0.0065
20300	1745.0	4.35	0	5.10	0.0029
20300	1745.0	4.35	10	11.13	0.0064
20300	1745.0	4.35	20	5.09	0.0029
20300	1745.0	4.35	30	6.29	0.0036
20300	1745.0	4.35	40	23.81	0.0136
20300	1745.0	4.35	50	17.94	0.0103
20300	1745.0	4.35	60	26.25	0.0150

APPENDIX 5C – LTE Band 4 RADIATED EMISSIONS TEST DATA

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Radiated Power Test Data Results

Date of Test: May 23, 2013

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 24.5 °C
Relative Humidity: 33.7 %

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

Measurements were performed with QPSK and 16QAM modulations. The smallest test margins are reported below.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

LTE band 4, 20MHz BW, RB=1, QPSK modulation

								Substitution Method					
EUT				Rx 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)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	20050	1720.00	4	Horn	V	-25.11	-25.11	V-V	-17.76	22.19	0.17	30.00	-7.81
F0	20050	1720.00	4	Horn	H	-28.55		H-H	-17.23				
F0	20175	1732.50	4	Horn	V	-24.02	-24.02	V-V	-16.60	23.47	0.22	30.00	-6.53
F0	20175	1732.50	4	Horn	H	-28.11		H-H	-16.16				
F0	20299	1744.90	4	Horn	V	-24.62	-24.62	V-V	-16.88	23.12	0.21	30.00	-6.88
F0	20299	1744.90	4	Horn	H	-27.96		H-H	-16.22				

LTE band 4, 20MHz BW, RB=1, 16-QAM modulation

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Isotropic Radiator)		Limit	Diff to Limit
		(MHz)				(dBuV)	(dBuV)			(dBm)	(dBm)		
F0	20050	1720.00	4	Horn	V	-26.20	-26.20	V-V	-18.89	21.07	0.13	30.00	-8.93
F0	20050	1720.00	4	Horn	H	-29.80		H-H	-18.35				
F0	20175	1732.50	4	Horn	V	-25.30	-25.30	V-V	-17.90	22.05	0.16	30.00	-7.95
F0	20175	1732.50	4	Horn	H	-28.97		H-H	-17.58				
F0	20299	1744.90	4	Horn	V	-25.56	-25.56	V-V	-17.85	22.17	0.16	30.00	-7.83
F0	20299	1744.90	4	Horn	H	-29.24		H-H	-17.17				

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 5C	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW	

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)							
1695.72	20050	H	1.00	18	PK	64.73	-91.34	-26.61	-13.00	-13.6
8555.56	19957	V	1.0	190	PK	53.74	-75.23	-21.49	-13.00	-8.5

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

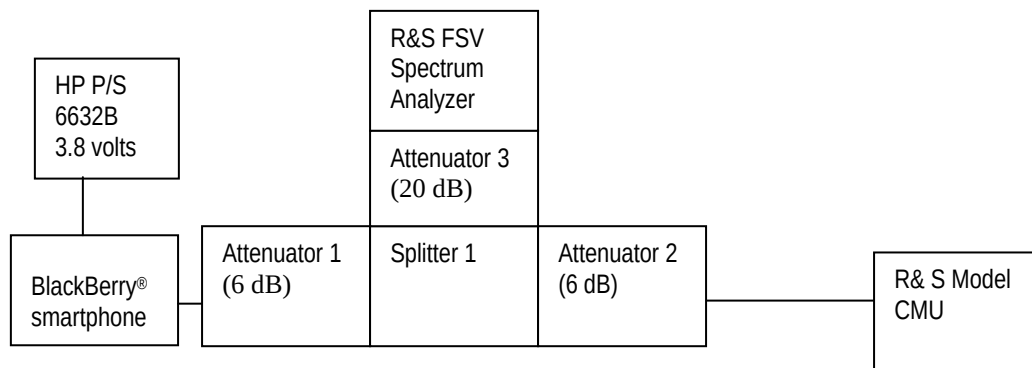
APPENDIX 6A – LTE Band 17 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 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.

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>
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: May 17-25, 2013.

The environmental test conditions were: Temperature: 21.8 – 22.5°C
 Relative Humidity: 19 – 19.2 %

The following measurements were performed by Berkin Can.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Emission Designator Table

LTE Band 17 Frequency (MHz)	Conducted Output Power (dBm)	RB Size	RB Offset	Emission Designator	RB Size	RB Offset	Band	Bandwidth (MHz)	Modulation
713.5	22.95	1	24	4M47G7D	25	0	LTE B17	5	QPSK
706.5	22.23	1	0	4M47D7W	25	0	LTE B17	5	16QAM
711	21.84	1	49	8M94G7D	50	0	LTE B17	10	QPSK
709	22.89	1	0	8M94D7W	50	0	LTE B17	10	16QAM

The conducted spurious emissions – As per 47 CFR 2.202, CFR 2.1046, CFR 27.53 CFR 27.54, CFR 27.50, RSS-139 were measured from 30 MHz to 20 GHz.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth for each 5MHz and 10MHz with different number of resource blocks for LTE band 17.

QPSK and 16-QAM modulations were applied to each of the bandwidths. Only the worst case measurements are documented in this report.

A minimum resource block condition was also measured (RB = 1).

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 LTE band 17 was measured to be 9.280MHz. 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 LTE Band 17 selected Frequencies in 10MHz BW (RB = 50)

LTE Band 17 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	QPSK	16-QAM
709.0	9.253	8.929	8.900
710.0	9.280	8.886	8.915
711.0	9.219	8.915	8.915

Peak to Average Ratio (PAR)

For each 5MHz and 10MHz with different number of resource blocks as per scalable bandwidths for LTE band 17, the peak to average ratio was measured on the low, middle and high channels with QPSK modulation.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

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 9.59 dB on in 10MHz bandwidth with 50 resource blocks.

Measurement Plots for LTE Band 17

See Figures 6-1a to 6-12a for the plots of the conducted spurious emissions.

See Figures 6-19a to 6-24a and 6-37a to 6-39a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

See Figures 6-25a to 6-32a for the plots of the Channel mask.

See Figures 6-33a to 6-36a for the plots of the Peak to Average Ratio.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-1a: Band 17, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)

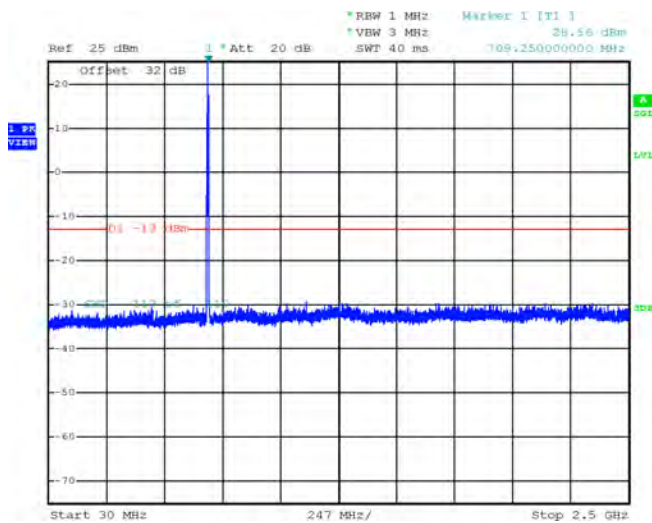


Figure 6-2a: Band 17, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)

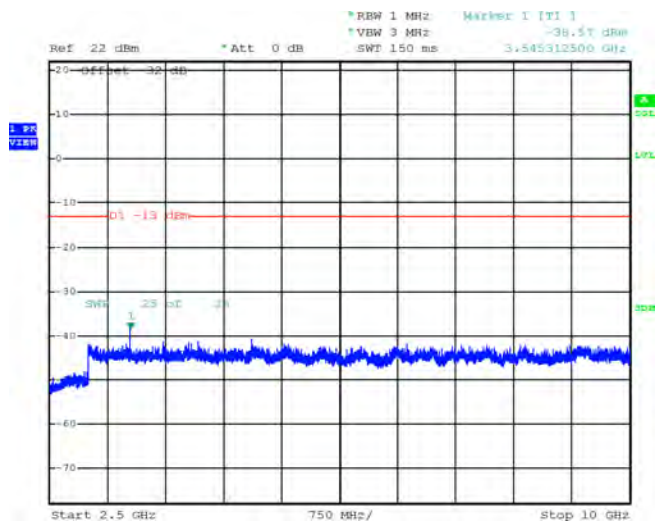


Figure 6-3a: Band 17, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)

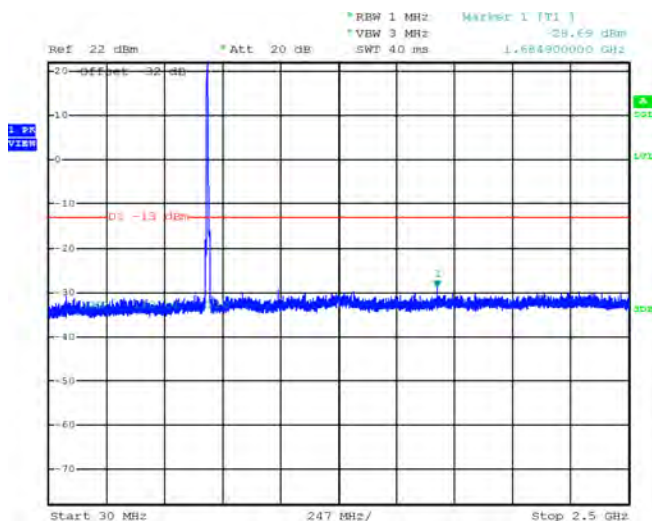
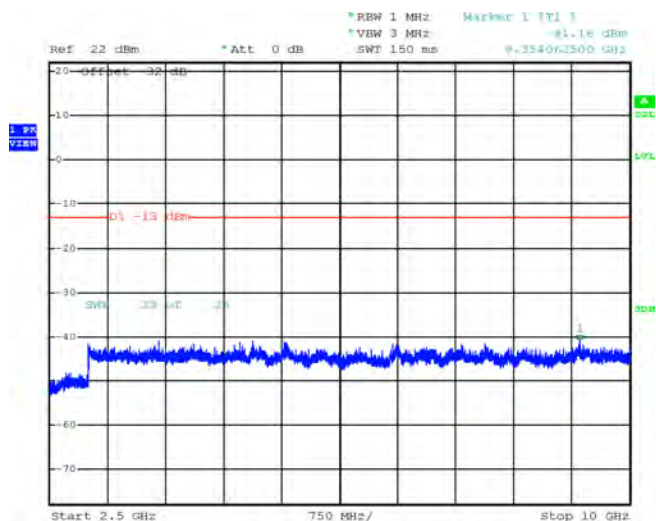


Figure 6-4a: Band 17, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-5a: Band 17, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)

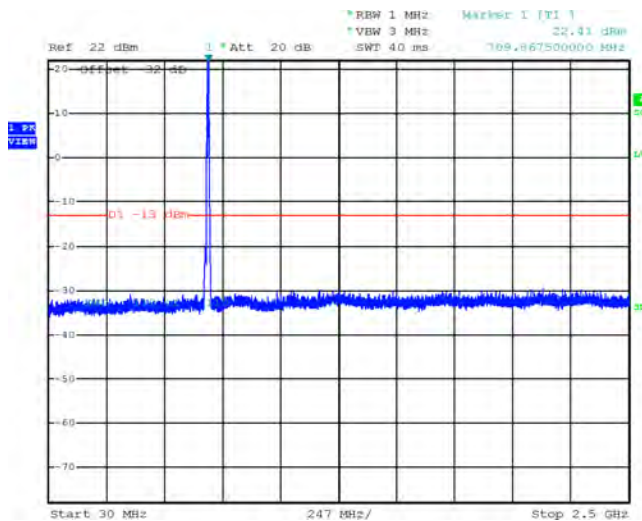


Figure 6-6a: Band 17, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)

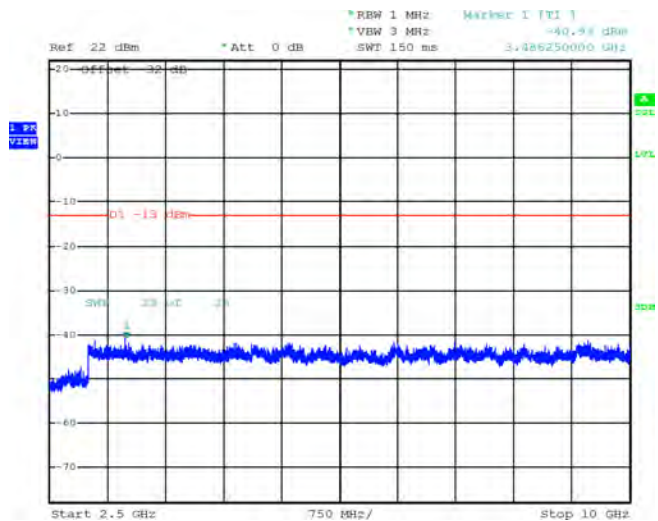


Figure 6-7a: Band 17, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)

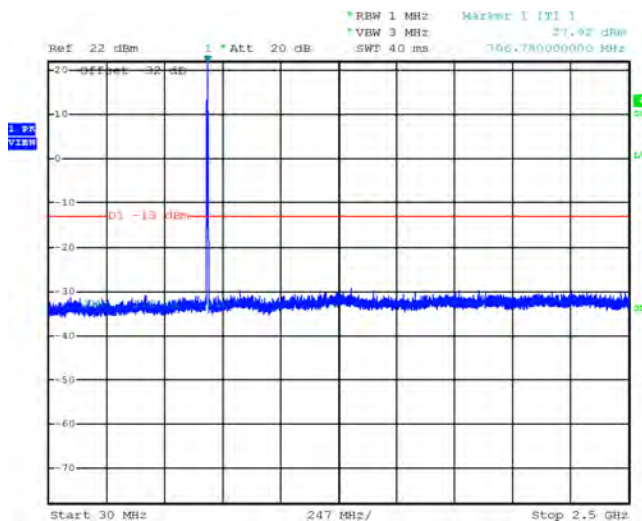
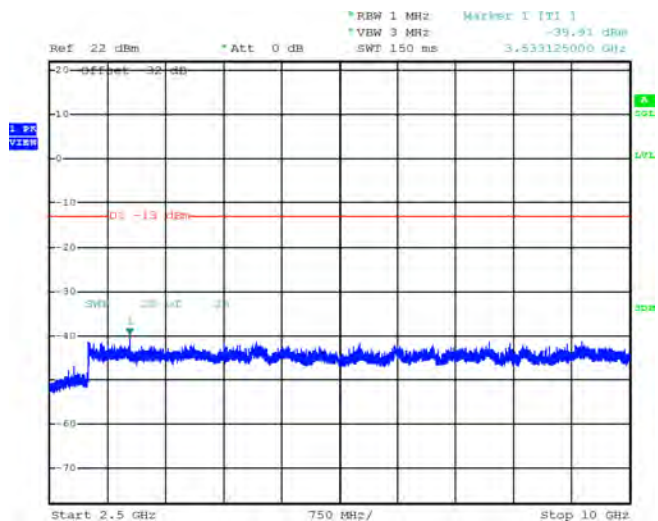


Figure 6-8a: Band 17, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-9a: Band 17, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)

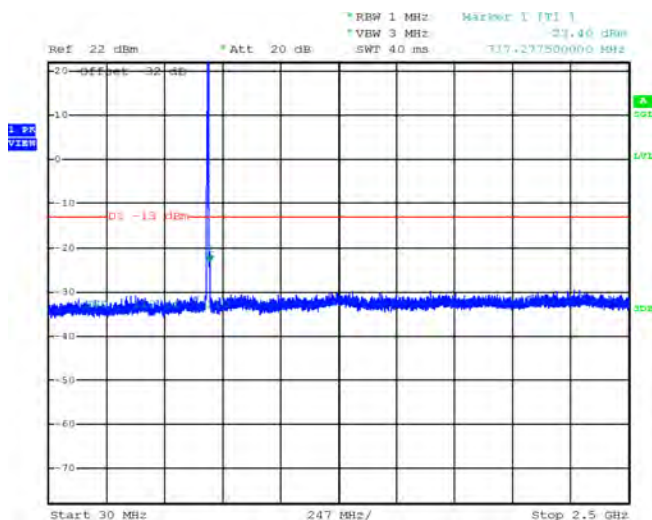


Figure 6-10a: Band 17, Spurious Conducted Emissions, High Channel, 5MHz BW (RB= 15)

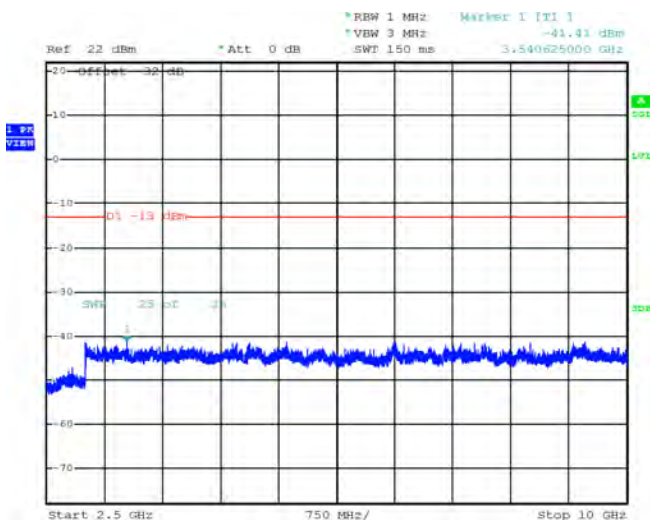


Figure 6-11a: Band 17, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)

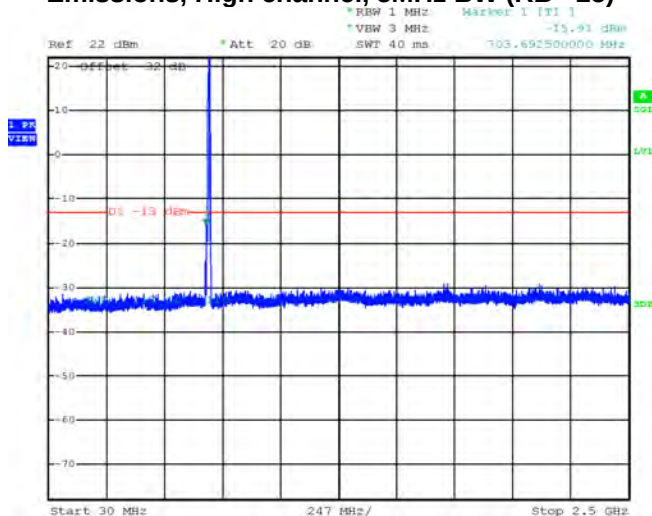
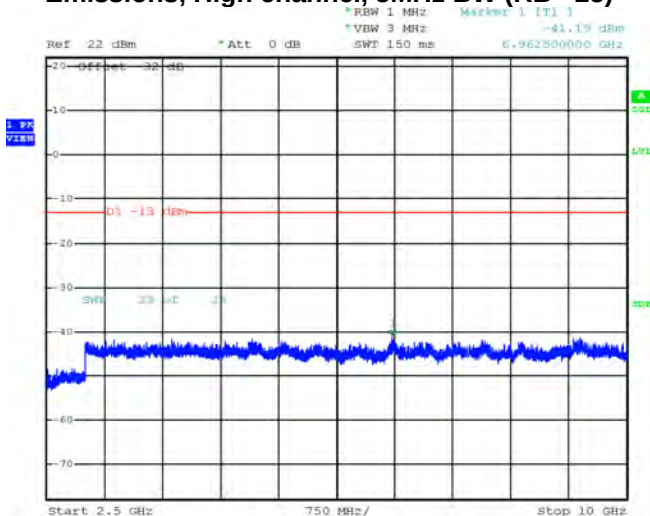


Figure 6-12a: Band 17, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-13a: Occupied Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50

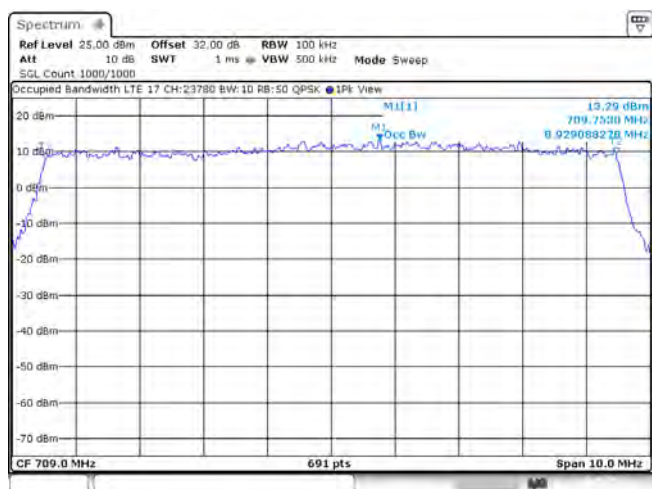


Figure 6-14a: Occupied Bandwidth, Band 17 Middle Channel, 10MHz BW, RB=50

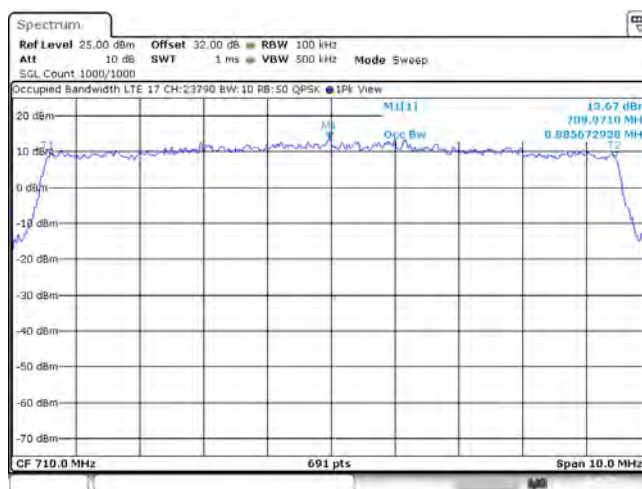
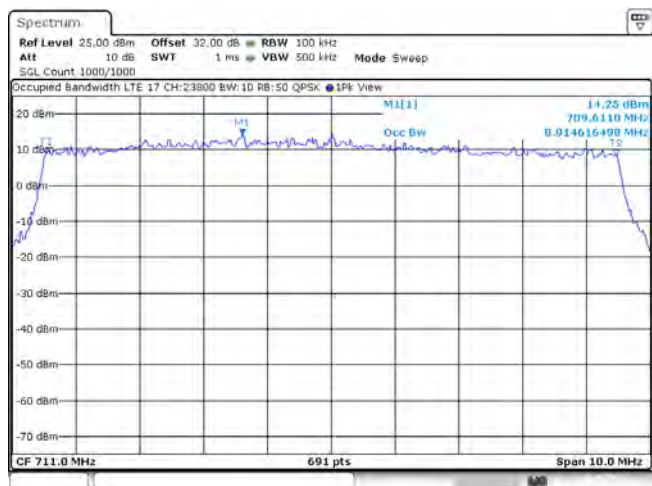


Figure 6-15a: Occupied Bandwidth, Band 17 High Channel, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-16a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25

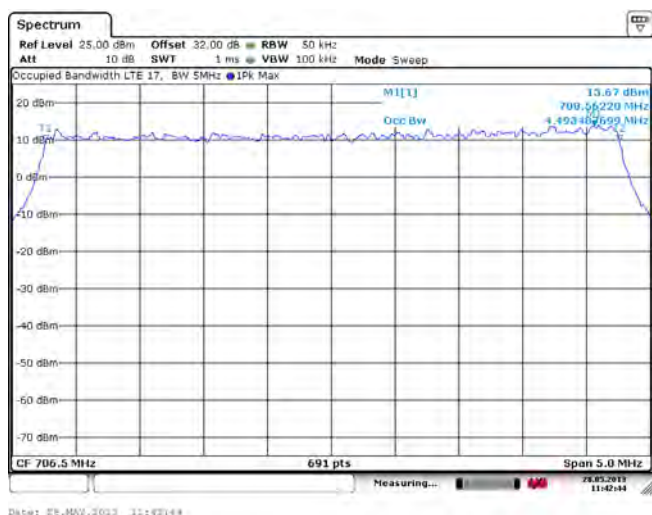


Figure 6-17a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=25

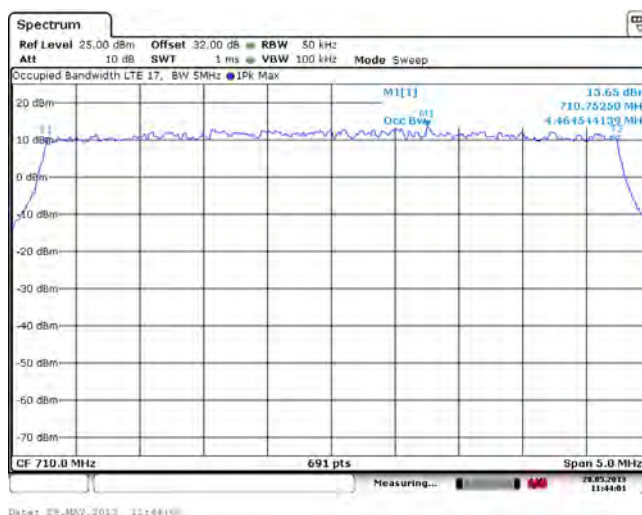
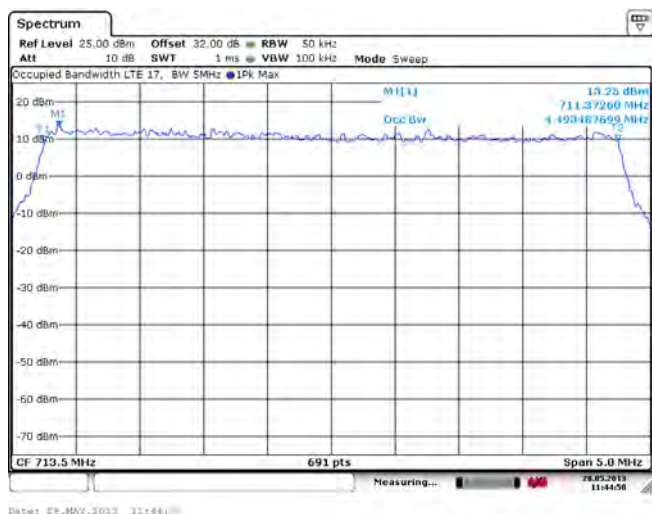


Figure 6-18a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-19a: -26 dBc Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50

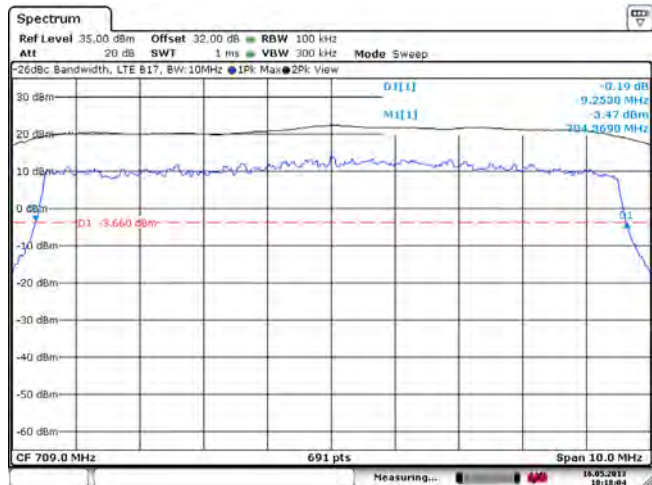


Figure 6-20a: -26 dBc Bandwidth, Band 17 Middle Channel, 10MHz BW, RB=50

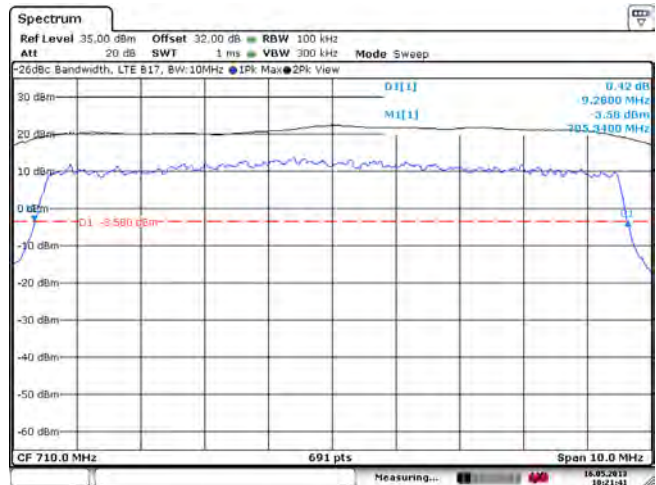


Figure 6-21a: -26 dBc Bandwidth, Band 17 High Channel, 10MHz BW, RB=50

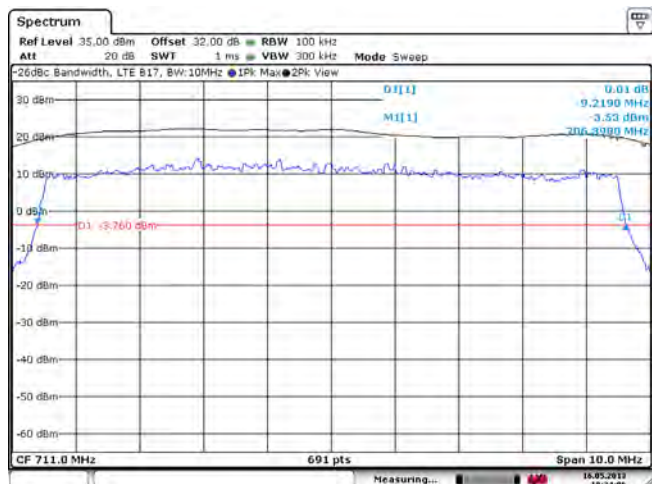
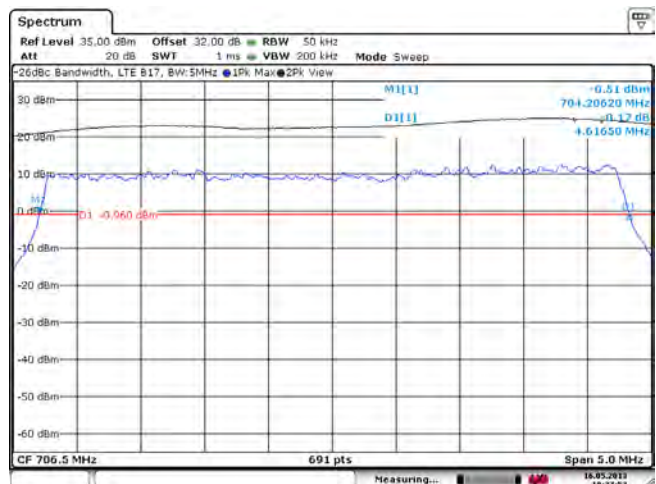


Figure 6-22a: -26 dBc Bandwidth, Band 17 Low Channel, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-23a: -26 dBc Bandwidth, Band 17 Middle Channel, 5MHz BW, RB=25

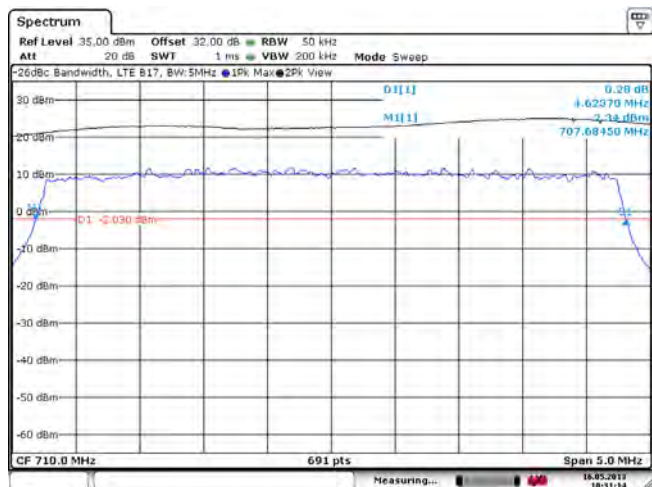


Figure 6-24a: -26 dBc Bandwidth, Band 17 High Channel, 5MHz BW, RB=25

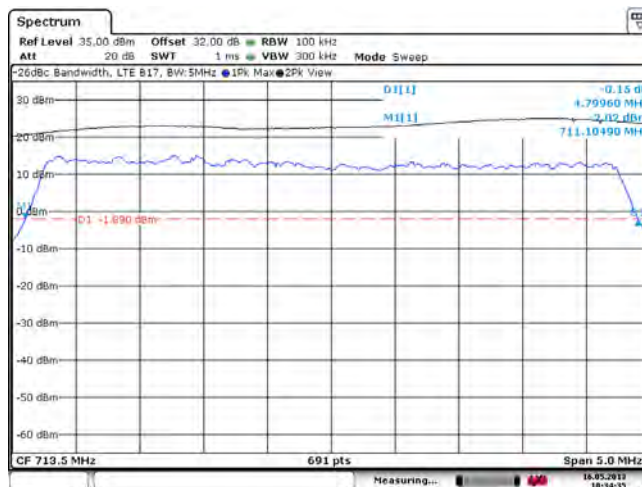


Figure 6-25a: Band 17 Low Channel Mask, 10MHz BW, RB=50

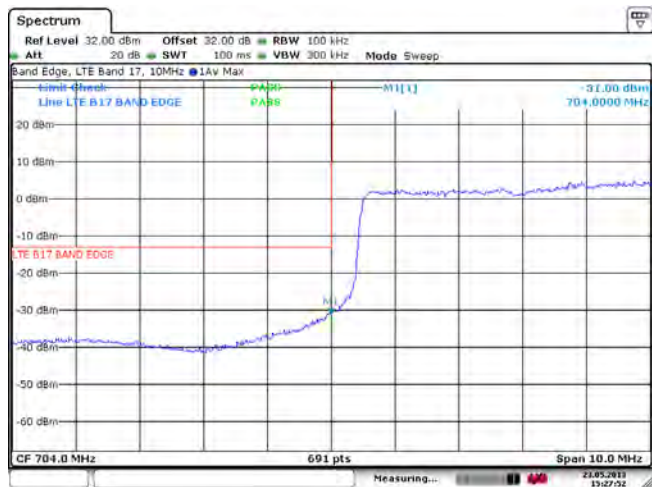
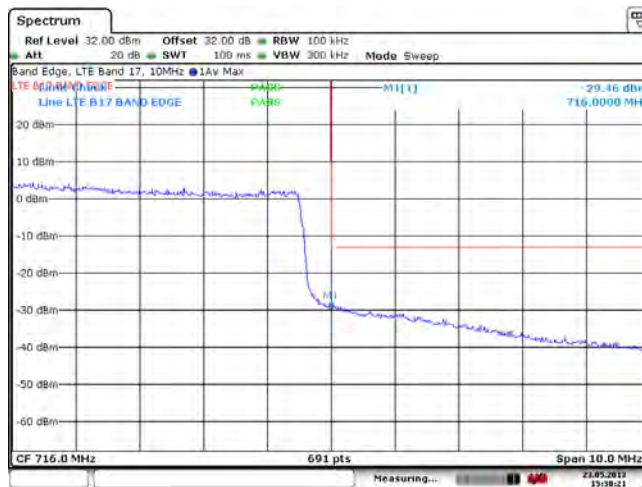


Figure 6-26a: Band 17 High Channel Mask, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-27a: Band 17 Low Channel Mask, 10MHz BW, RB=1

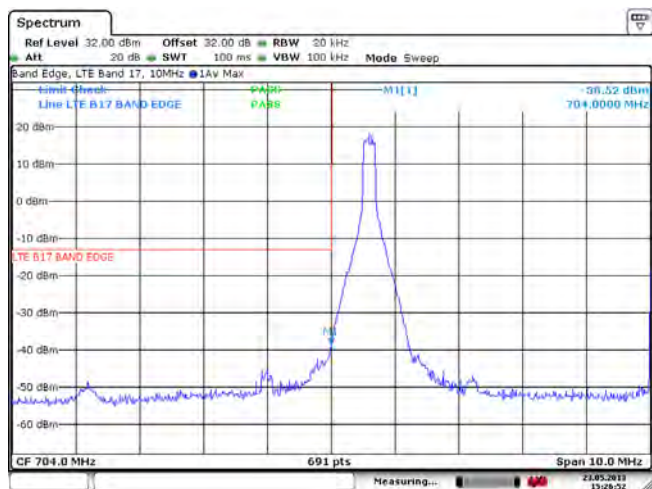


Figure 6-28a: Band 17 High Channel Mask, 10MHz BW, RB=1

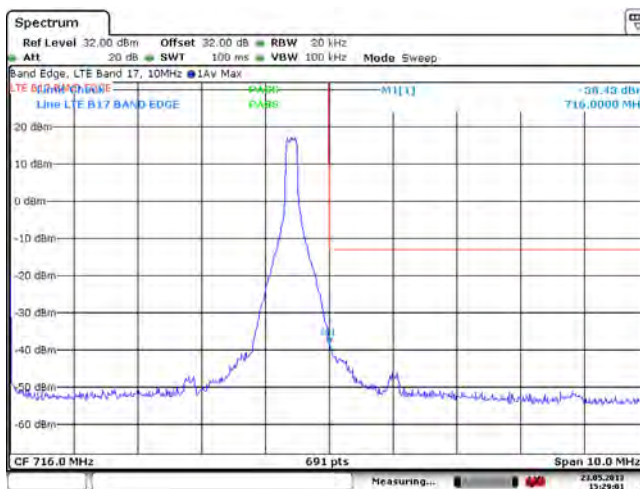


Figure 6-29a: Band 17 Low Channel Mask, 5MHz BW, RB=25

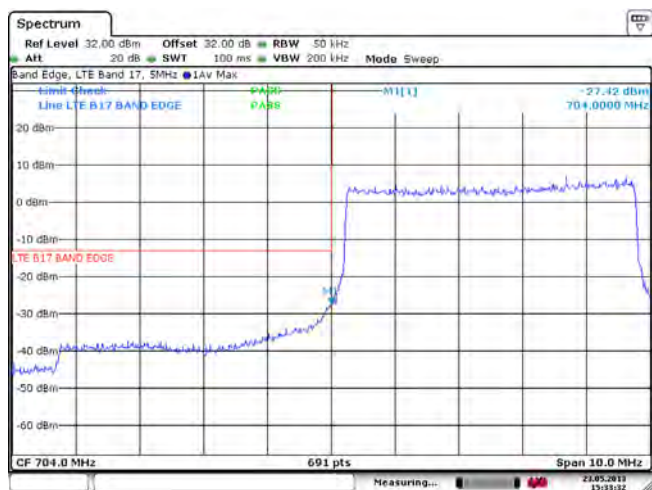
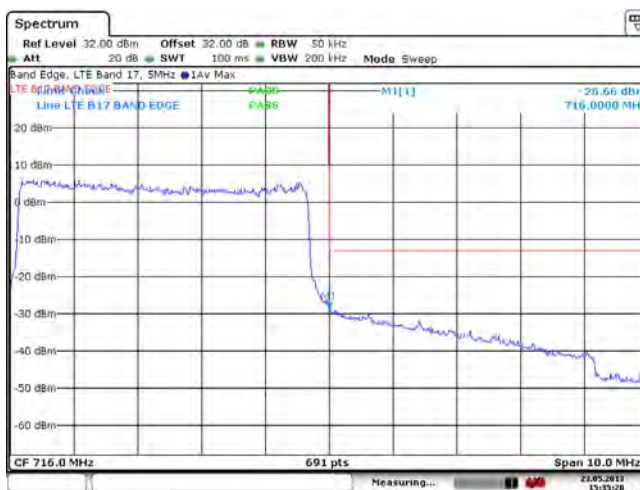


Figure 6-30a: Band 17 High Channel Mask, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-31a: Band 17 Low Channel Mask, 5MHz BW, RB=1

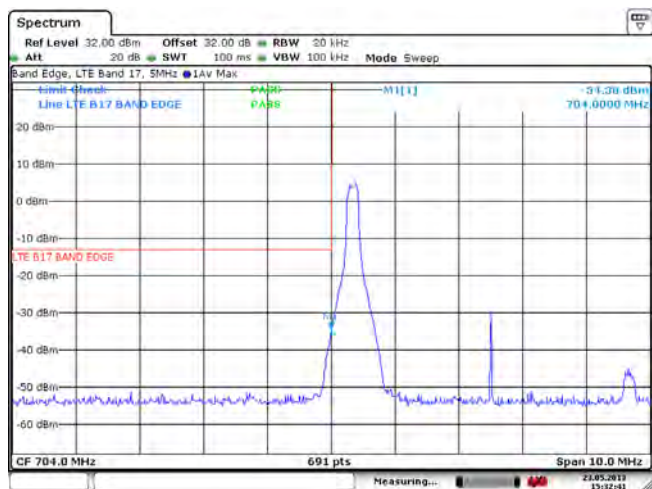


Figure 6-32a: Band 17 High Channel Mask, 5MHz BW, RB=1

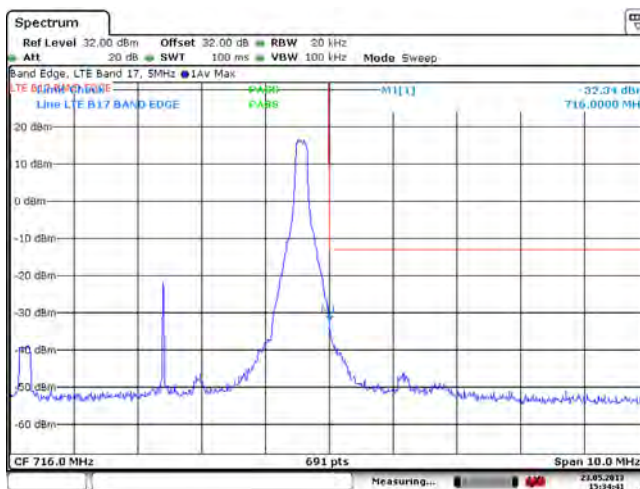


Figure 6-33a: Band 17 Mid Channel PAR, 10MHz BW, RB=25

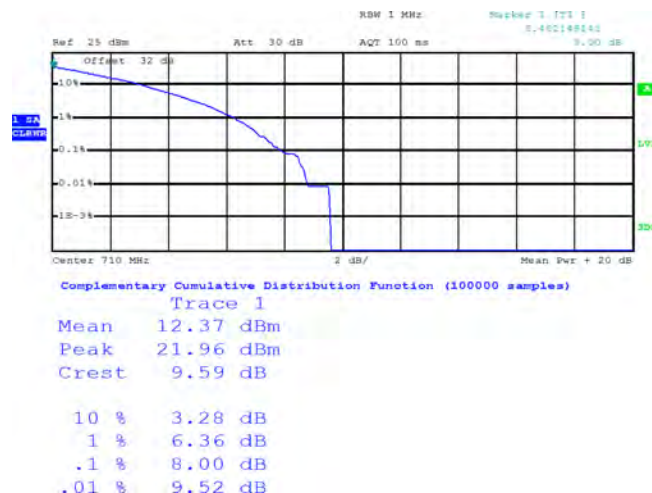
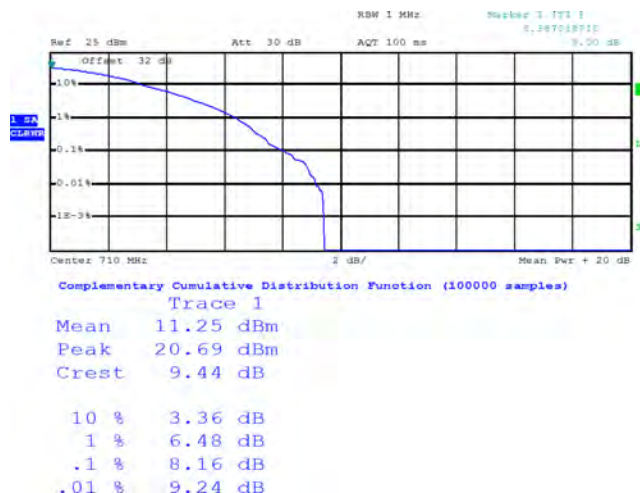


Figure 6-34a: Band 17 Middle Channel PAR, 10MHz BW, RB=50



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-35a: Band 17 Mid Channel PAR, 5MHz BW, RB=15

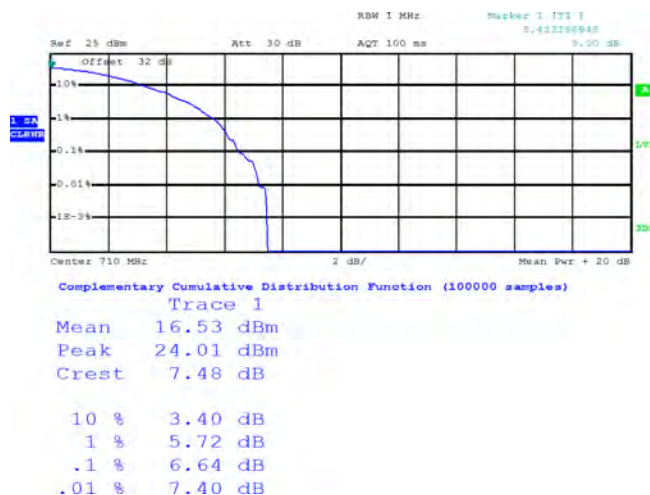
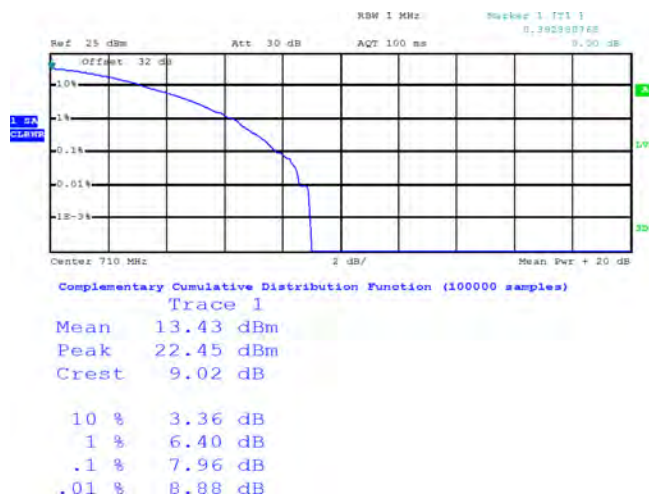


Figure 6-36a: Band 17 Mid Channel PAR, 5MHz BW, RB=25



	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6A	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-37a: Occupied Bandwidth, Band 17 Low Channel, 20MHz BW (RB= 100) 16-QAM

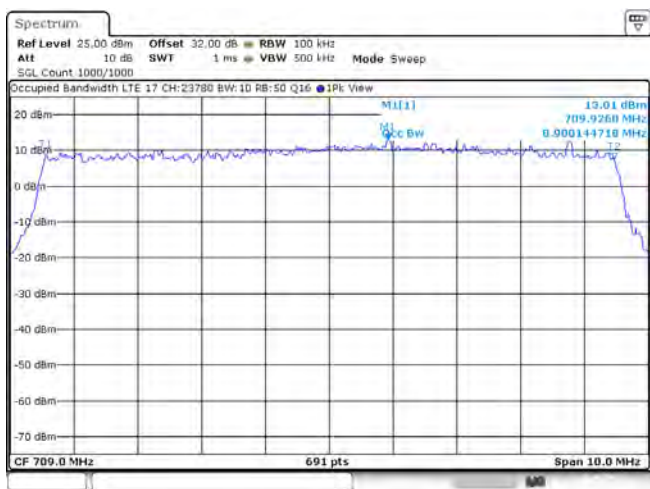


Figure 6-38a: Occupied Bandwidth, Band 17 Mid Channel, 20MHz BW (RB= 100) 16-QAM

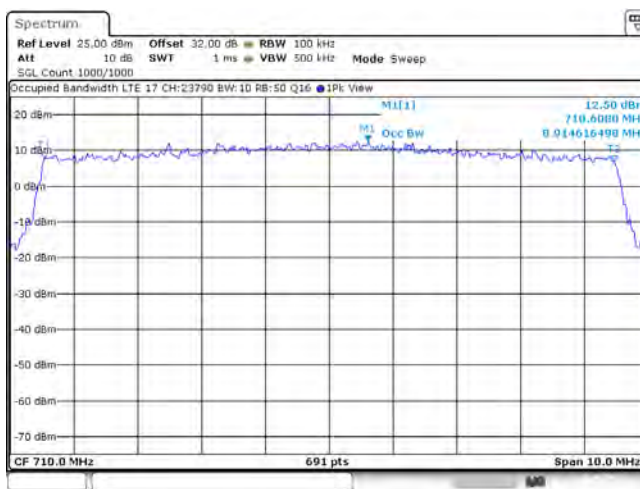
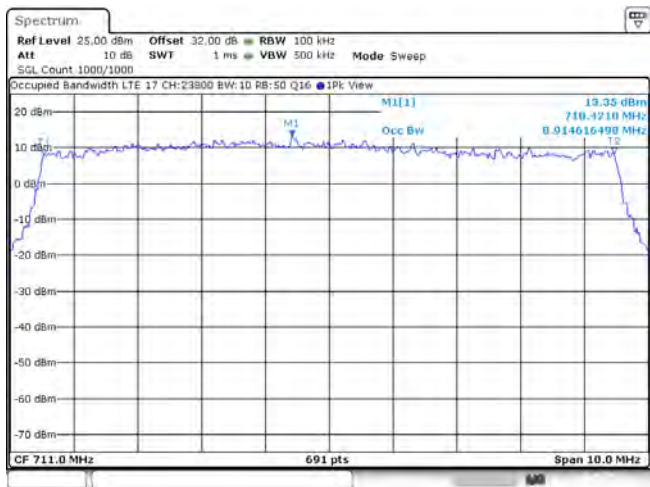


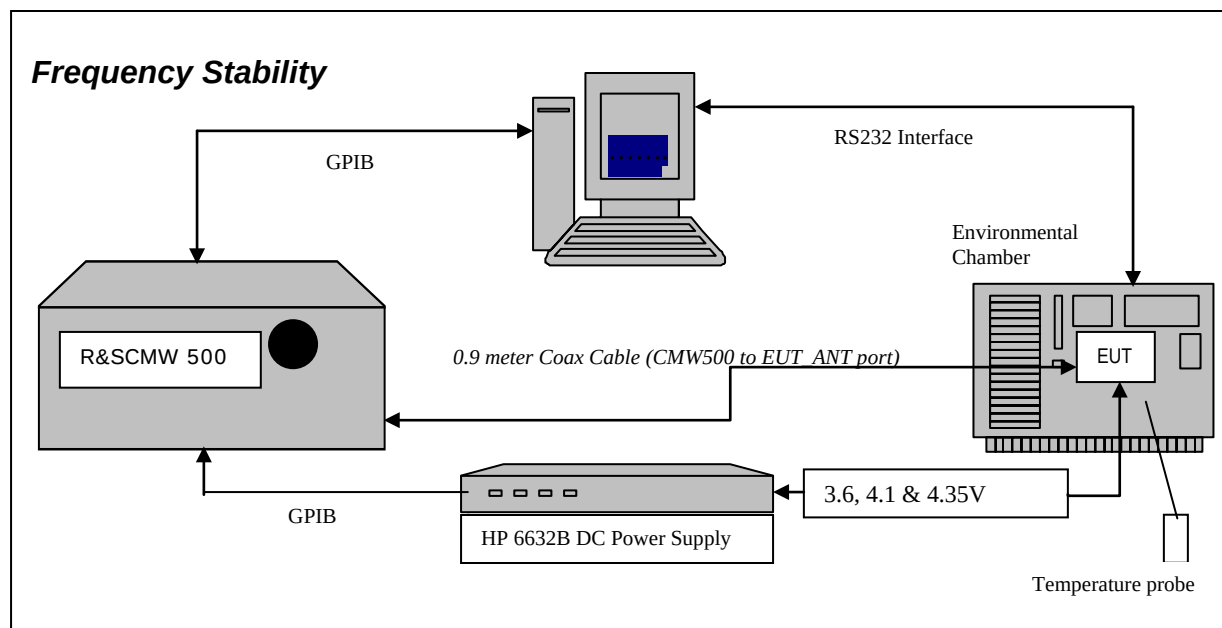
Figure 6-39a: Occupied Bandwidth, Band 17 High Channel, 20MHz BW (RB= 100) 16-QAM



APPENDIX 6B – LTE Band 17 FREQUENCY STABILITY TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE Band 17 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

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 27.54, CFR 47 and RSS-139, 6.3 Frequency Stability.

Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMW 500 and the EUT antenna port.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 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 CMW 500 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 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 709.0 MHz, 710.0 MHz and 711.0 MHz each was measured under 10 MHz bandwidth with maximum (50) resource blocks. 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.

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

Procedure:

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

- Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
- Start test program
- Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
- Set power supply voltage to 3.6 volts.
- Set up CMW 500 Radio Communication Tester.
- Command the CMW 500 to switch to the low channel.
- Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
- EUT is commanded to Transmit 100 Bursts.
- Software logs the following data from the CMW 500, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
- The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
- Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
- Increase temperature by 10°C and soak for 1/2 hour.
- Repeat steps 4 - 12 for temperatures –30°C to 60°C.
- 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 LTE band 17 measured was **0.0295 PPM**.

		EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFR100LW	IC: 2503A-RFS120LW IC: 2503A-RFR100LW

Date of test: May 23, 2013

LTE Band 17 results: channels 23780, 23790 and 23800 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.6	20	4.08	0.0058
23790	710.0	3.6	20	18.01	0.0254
23800	711.0	3.6	20	2.78	0.0039

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	20	4.51	0.0064
23790	710.0	4.1	20	6.97	0.0098
23800	711.0	4.1	20	-0.25	-0.0004

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	20	0.89	0.0013
23790	710.0	4.35	20	16.33	0.0230
23800	711.0	4.35	20	11.87	0.0167

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 17 Results: channel 23780 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.6	-30	-0.85	-0.0012
23780	709.0	3.6	-20	5.38	0.0076
23780	709.0	3.6	-10	6.39	0.0090
23780	709.0	3.6	0	-8.03	-0.0113
23780	709.0	3.6	10	20.94	0.0295
23780	709.0	3.6	20	4.08	0.0058
23780	709.0	3.6	30	5.46	0.0077
23780	709.0	3.6	40	6.55	0.0092
23780	709.0	3.6	50	1.56	0.0022
23780	709.0	3.6	60	8.36	0.0118
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	-30	3.28	0.0046
23780	709.0	4.1	-20	10.23	0.0144
23780	709.0	4.1	-10	4.69	0.0066
23780	709.0	4.1	0	14.93	0.0211
23780	709.0	4.1	10	2.74	0.0039
23780	709.0	4.1	20	4.51	0.0064
23780	709.0	4.1	30	10.33	0.0146
23780	709.0	4.1	40	-6.09	-0.0086
23780	709.0	4.1	50	-7.21	-0.0102
23780	709.0	4.1	60	10.75	0.0152
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	-30	1.85	0.0026
23780	709.0	4.35	-20	5.77	0.0081
23780	709.0	4.35	-10	9.23	0.0130
23780	709.0	4.35	0	0.77	0.0011
23780	709.0	4.35	10	16.17	0.0228
23780	709.0	4.35	20	0.89	0.0013
23780	709.0	4.35	30	8.87	0.0125
23780	709.0	4.35	40	-1.17	-0.0017
23780	709.0	4.35	50	11.86	0.0167
23780	709.0	4.35	60	15.25	0.0215

Test Report No.:
RTS-6036-1303-30B

Dates of Test:
February 26 to May 30, 2013

FCC ID: L6ARFS120LW
FCC ID: L6ARFR100LW

IC: 2503A-RFS120LW
IC: 2503A-RFR100LW

LTE band 5 Results: channel 23790 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	3.6	-30	13.54	0.0191
23790	710.0	3.6	-20	7.77	0.0109
23790	710.0	3.6	-10	9.48	0.0134
23790	710.0	3.6	0	20.39	0.0287
23790	710.0	3.6	10	-0.80	-0.0011
23790	710.0	3.6	20	18.01	0.0254
23790	710.0	3.6	30	14.01	0.0197
23790	710.0	3.6	40	13.69	0.0193
23790	710.0	3.6	50	18.13	0.0255
23790	710.0	3.6	60	17.94	0.0253
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.1	-30	14.59	0.0205
23790	710.0	4.1	-20	9.83	0.0138
23790	710.0	4.1	-10	15.00	0.0211
23790	710.0	4.1	0	-2.17	-0.0031
23790	710.0	4.1	10	8.41	0.0118
23790	710.0	4.1	20	6.97	0.0098
23790	710.0	4.1	30	4.23	0.0060
23790	710.0	4.1	40	9.34	0.0132
23790	710.0	4.1	50	10.15	0.0143
23790	710.0	4.1	60	5.40	0.0076
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.35	-30	3.05	0.0043
23790	710.0	4.35	-20	4.37	0.0062
23790	710.0	4.35	-10	8.67	0.0122
23790	710.0	4.35	0	13.55	0.0191
23790	710.0	4.35	10	0.26	0.0004
23790	710.0	4.35	20	16.33	0.0230
23790	710.0	4.35	30	4.00	0.0056
23790	710.0	4.35	40	4.96	0.0070
23790	710.0	4.35	50	8.76	0.0123
23790	710.0	4.35	60	0.39	0.0005

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6B	
Test Report No.: RTS-6036-1303-30B	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW IC: 2503A-RFS120LW FCC ID: L6ARFR100LW IC: 2503A-RFR100LW

LTE band 17 Results: channel 23800 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	3.6	-30	2.37	0.0033
23800	711.0	3.6	-20	4.61	0.0065
23800	711.0	3.6	-10	-1.65	-0.0023
23800	711.0	3.6	0	0.50	0.0007
23800	711.0	3.6	10	11.90	0.0167
23800	711.0	3.6	20	2.78	0.0039
23800	711.0	3.6	30	3.38	0.0048
23800	711.0	3.6	40	1.40	0.0020
23800	711.0	3.6	50	14.72	0.0207
23800	711.0	3.6	60	4.73	0.0067
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.1	-30	-0.12	-0.0002
23800	711.0	4.1	-20	3.93	0.0055
23800	711.0	4.1	-10	-1.58	-0.0022
23800	711.0	4.1	0	11.48	0.0161
23800	711.0	4.1	10	-4.96	-0.0070
23800	711.0	4.1	20	-0.25	-0.0004
23800	711.0	4.1	30	16.22	0.0228
23800	711.0	4.1	40	15.14	0.0213
23800	711.0	4.1	50	5.49	0.0077
23800	711.0	4.1	60	12.39	0.0174
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.35	-30	4.98	0.0070
23800	711.0	4.35	-20	3.95	0.0056
23800	711.0	4.35	-10	-4.49	-0.0063
23800	711.0	4.35	0	11.11	0.0156
23800	711.0	4.35	10	16.36	0.0230
23800	711.0	4.35	20	11.87	0.0167
23800	711.0	4.35	30	2.57	0.0036
23800	711.0	4.35	40	15.81	0.0222
23800	711.0	4.35	50	1.42	0.0020
23800	711.0	4.35	60	5.80	0.0082

APPENDIX 6C – LTE Band 17 RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFS121LW, RFR101LW APPENDIX 6C			
Test Report No.: RTS-6036-1303-30A	Dates of Test: February 26 to May 30, 2013	FCC ID: L6ARFS120LW FCC ID: L6ARFT80UW	IC: 2503A-RFS120LW IC: 2503A-RFT80UW	

Radiated Emissions Test Data Results cont'd

Date of Test: May 17, 2013

The following measurements were performed by Feras Obeid.

The environmental test conditions were: Temperature: 24.3 °C
 Relative Humidity: 34.5 %

The BlackBerry® smartphone was standalone, vertically with LCD facing 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 LTE band 17 with QPSK modulation for 5MHz BW (channel 23755, 23790 and 23824 with RB = 1) and 10MHz BW (channel 23780, 23790, 23800 with RB = 50 and RB = 1) and with 16-QAM modulation for 5MHz BW (channel 23790 with RB = 1) and 10MHz BW (channel 23790 with RB = 50 and RB = 1).

All emissions were at least 25.0 dB below the limit.

Date of Test: May 7, 2013 to May 23, 2013

The following measurements were performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 26.1°C
 Relative Humidity: 35.5 %

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 10 GHz.

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

Measurements were performed in LTE band 17 with QPSK modulation for 5MHz BW (channel 23755, 23790 and 23824 with RB = 1) and 10MHz BW (channel 23780, 23790, 23800 with RB = 50 and RB = 1) and with 16-QAM modulation for 5MHz BW (channel 23790 with RB = 1) and 10MHz BW (channel 23790 with RB = 50 and RB = 1).

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)							
1413.06	23755	H	1.03	262	PK	73.17	-91.70	-18.53	-13.00	-5.5

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