

# EMI Test Report

Tested in accordance with  
Federal Communications Commission (FCC)  
Personal Communications Services  
CFR 47, Parts 2, 22, 24, 27  
&  
Industry Canada (IC), RSS-GEN, 132, 133, 139 (Only applies to RGF111LW)

## BlackBerry RTS

### A division of BlackBerry Limited

**REPORT NO.:** RTS-6050-1309-23A

**PRODUCT MODEL NO.:** RGE111LW, RGF111LW  
**TYPE NAME:** BlackBerry® smartphone  
**FCC ID:** Not Applicable, L6ARGF110LW  
**IC:** Not Applicable, 2503A-RGF110LW

**EMISSION DESIGNATOR (GSM):** 246KGXW  
**EMISSION DESIGNATOR (EDGE):** 248KG7W  
**EMISSION DESIGNATOR (WCDMA):** 4M18F9W  
**EMISSION DESIGNATOR (LTE QPSK):** See details in Appendix  
**EMISSION DESIGNATOR (LTE 16QAM):** See details in Appendix

**DATE:** September 25, 2013

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



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<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**Statement of Performance:**

The BlackBerry® smartphone, model RGE111LW, part number CER-57712-001 - Rev1-x01-00 and accessories when configured and operated per BlackBerry's operation instructions performs within the requirements of the test standards.

The BlackBerry® smartphone, model RGF111LW, part number CER-57711-001 Rev1-x01-00 and accessories when configured and operated per BlackBerry's operation instructions performs within the requirements of the test standards.

**Declaration:**

We hereby certify that:

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

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

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

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

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## A. Scope

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

- FCC CFR 47 Part 2, Subpart J, Equipment Authorization Procedures, Oct, 2012.
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct., 2012.
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct., 2012.
- 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. BlackBerrySystemSimilarity\_RGE111LW\_RGF111LW
2. Test Report : 1-6234\_13-08-02
3. Test Report : 1-6234\_13-08-03
4. Test Report : 1-6234\_13-08-04
5. Test Report : 1-6234\_13-08-05\_A

## C. Product Identification

Manufactured by BlackBerry Limited whose headquarters is located at:

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

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

BlackBerry RTS 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 August 16 to September 9, 2013.

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BlackBerry® smartphone Samples Tested

Sample	Model	CER NUMBER	PIN	Software Information
1	RGE111LW	CER-57712-001 - Rev1-x01-00	2FFF53EB	OS: 10.2.0.981
2	RGE111LW	CER-57712-001 - Rev1-x01-00	2FFF53EA	OS: 10.2.0.981
3	RGE111LW	CER-57712-001 - Rev1-x01-00	2FFF549C	OS: 10.2.0.981
4	RGF111LW	CER-57711-001 - Rev1-x01-00	2FFF53EB	OS: 10.2.0.981

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

Only the characteristics that may have been affected by the changes from RGE111LW to RGF111LW were re-tested.

For more information, see BlackBerrySystemSimilarity\_RGE111LW\_RGF111LW.

**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.

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### E. Test Results Chart

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 24.238	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5	GSM850 / PCS1900 Conducted Spurious Emissions	Pass	1A
Part 2.1049 Part 22.917 Part 24.238	RSS-GEN, 4.6	GSM 850 / PCS1900 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.1055 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	1-6234_13-08-02
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	1-6234_13-08-02
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 II/IV/V 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 II/IV/V Occupied Bandwidth and Channel Mask	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 II/IV/V 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 V ERP WCDMA Band II EIRP WCDMA Band IV EIRP	Pass	1-6234_13-08-02
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 II/IV/V Radiated Spurious/Harmonic Emissions	Pass	1-6234_13-08-02
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

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Part 24.232(b)(c)	RSS-133, 6.4	LTE Band 2 EIRP	Pass	1-6234_13-08-04
Part 24.238	RSS-133, 6.5	LTE Band 2 Radiated Spurious/Harmonic Emissions	Pass	1-6234_13-08-04
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	1-6234_13-08-03
Part 22.917	RSS-132, 5.5	LTE Band 5 Radiated Spurious/Harmonic Emissions	Pass	1-6234_13-08-03
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	1-6234_13-08-05-A
Part 2.1053 Part 27.53(h)	RSS-139, 6.5	LTE Band 4 Radiated Spurious/Harmonic Emissions	Pass	1-6234_13-08-05-A
Part 2.1051 Part 27.53(g)	-	LTE Band 17 Conducted Spurious Emissions	Pass	6A
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	1-6234_13-08-05-A
Part 2.1053 Part 27.53(g)	-	LTE Band 17 Radiated Spurious/Harmonic Emissions	Pass	1-6234_13-08-05-A

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## F. Summary of Results

### 1) Conducted Emission Measurements

The following tests were performed on model RGE111LW.

- The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the GSM850 as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d), RSS-132, 5.5 and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 10 GHz.

See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the PCS1900 as per 47 CFR 2.1051, CFR 24.238(a), RSS-133, 6.5 and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 20 GHz.

See APPENDIX 1A for test data

- The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the GSM850 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 246.0 kHz on the low and middle channels in CALL mode, and 246.0 kHz on middle and high channels in EDGE mode.

See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the PCS1900 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 246.0 kHz on high channel in CALL mode, and 248.0 kHz on the low channel in EDGE mode.

See APPENDIX 1A for test data.

- The BlackBerry® smartphone met the requirements of the Frequency Stability in the GSM850 as per 47 CFR 2.1055 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 BlackBerry® smartphone met the requirements of the Frequency Stability in the PCS1900 as per 47 CFR 2.1055, CFR 24.235 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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The following tests were performed on model RGE111LW.

- The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the WCDMA band V as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d) and RSS-GEN, 4.9. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 10 GHz. See APPENDIX 2A for test data.
- The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band V as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in Voice Call and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.165 MHz on all channels in Loopback mode, and 4.175 MHz on the low channel in HSUPA mode. See APPENDIX 2A for test data.
- The BlackBerry® smartphone met the requirements of the Frequency Stability in the WCDMA band V as per 47 CFR 2.1055 and RSS-132, 5.3. The EUT was measured in WCDMA band V Voice call mode on the low, middle and high channels. See APPENDIX 2B for test data.

The following tests were performed on model RGF111LW.

The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the WCDMA band 2 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-GEN, 4.9. 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 BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the WCDMA band 2 as per 47 CFR 2.202, CFR 24.238 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 4.180 MHz on the middle and high channels in Loopback mode, and 4.170 MHz on the middle and high channels in HSUPA mode. See APPENDIX 2A for test data.

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The following tests were performed on model RGF111LW.

The BlackBerry® smartphone 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 WCDMA band 2 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.

The BlackBerry® smartphone 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 BlackBerry® smartphone 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. The worst case occupied bandwidth was 17.87 MHz on the low and middle channel in 20MHz BW, 100 resource blocks and QPSK modulation. See Appendix 3A for test data

The BlackBerry® smartphone 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. The worst case Peak to Average Ratio was 9.10 dB on mid channel in 20MHz bandwidth with 100 resource blocks. See APPENDIX 3A for test data

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The BlackBerry® smartphone 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.

The BlackBerry® smartphone 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 BlackBerry® smartphone 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. The worst case occupied bandwidth was 8.931 MHz on the mid channel in 10MHz BW, 50 resource blocks and QPSK modulation.  
See APPENDIX 4A for test data.

The BlackBerry® smartphone 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.

The BlackBerry® smartphone 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 BlackBerry® smartphone 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. The worst case occupied bandwidth was 17.87 MHz on all channels in 20MHz BW, 100 resource blocks and QPSK modulation.  
See Appendix 5A for test data

The BlackBerry® smartphone 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. The worst case Peak to Average Ratio was 9.24 dB on middle channel in 10MHz bandwidth with 100 resource blocks.  
See APPENDIX 5A for test data

The BlackBerry® smartphone 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.

The BlackBerry® smartphone 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 BlackBerry® smartphone 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. The worst case occupied bandwidth was 8.946 MHz on the middle channel in 10MHz BW, 50 resource blocks and QPSK modulation.  
See Appendix 6A for test data

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The BlackBerry® smartphone 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. The worst case Peak to Average Ratio was 9.94 dB on middle channel in 10MHz bandwidth with 100 resource blocks.

See APPENDIX 6A for test data

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

See APPENDIX 6B for test data.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### G. 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	14-02-13	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	14-02-13	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	14-08-13	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	14-08-07	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	15-05-07	Radiated Emissions
Horn Antenna	Emco	3117	47563	15-08-07	Radiated Emissions
Horn Antenna	ETS	3116	2538	14-09-29	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	14-11-27	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	13-11-26	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	13-11-25	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	109747	13-10-18	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	13-11-30	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	13-11-30	Radiated Emissions
DC Power Supply	HP	6632B	US37472178	13-09-25	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	13-10-30	Radiated Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380567	13-10-30	Radiated Emissions

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<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### Compliance Test Equipment Used cont'd

<u>UNIT</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NUMBER</u>	<u>CAL DUE DATE</u> (YY MM DD)	<u>USE</u>
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	101469	13-12-10	Radiated /RF Conducted Emission
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	109949	13-12-08	Radiated /RF Conducted Emission
Signal Generator	Agilent	E8257D	MY45140527	14-12-10	Radiated Emissions
Signal Generator	Agilent	83630B	3844A00927	14-11-23	Radiated Emissions
Spectrum Analyzer	Rohde & Schwarz	FSV	101820	13-11-28	RF Conducted Emissions
Spectrum Analyzer	Rohde & Schwarz	FSP	100884	13-11-22	RF Conducted Emissions

### H. Test Software used

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

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

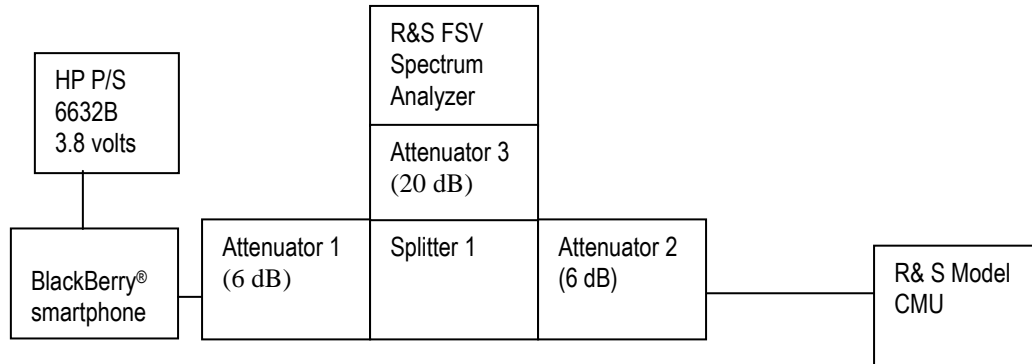


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### 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

The environmental test conditions were:

Temperature: 25.4 °C  
Relative Humidity: 37.8 %

The following measurements were performed by Chuan Tran.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### GSM Conducted RF Emission Test Data cont'd

The following tests were performed on model RGE111LW.

**The conducted spurious emissions** – As per 47 CFR 2.1051, CRF 22.917, CFR 24.238(a), RSS-GEN, 4.9, RSS-132, 5.5 and RSS-133, 6.5 were measured from 30 MHz to 20 GHz.

#### **–26 dBc Bandwidth and Occupied Bandwidth (99%)**

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

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

The worst case –26dBc bandwidth for the GSM850 band was measured to be 270 kHz, and for the PCS1900 band was measured to be 276 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

<b>GSM850 band Frequency (MHz)</b>	<b>-26dBc Bandwidth (kHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>
824.2	270.0	<b>246.0</b>
837.6	268.0	<b>246.0</b>
848.8	268.0	244.0

<b>PCS1900 band Frequency (MHz)</b>	<b>-26dBc Bandwidth (kHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>
1850.2	266.0	244.0
1880.0	276.0	242.0
1909.8	266.0	<b>246.0</b>

#### **Measurement Plots for 850 and 1900 bands in Call mode**

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

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

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

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

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

**Test Data for GSM850 and PCS1900 bands in EDGE mode**

<b>GSM850 band Frequency (MHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>
824.2	244.0
837.6	<b>246.0</b>
848.8	<b>246.0</b>

<b>PCS1900 band Frequency (MHz)</b>	<b>99% Occupied Bandwidth (kHz)</b>
1850.2	<b>248.0</b>
1880.0	244.0
1909.8	246.0

***Measurement Plots for GSM850 and PCS1900 bands in EDGE mode***

See Figures 1-29a to 1-34a for the plots of the 99% Occupied Bandwidth EDGE results.

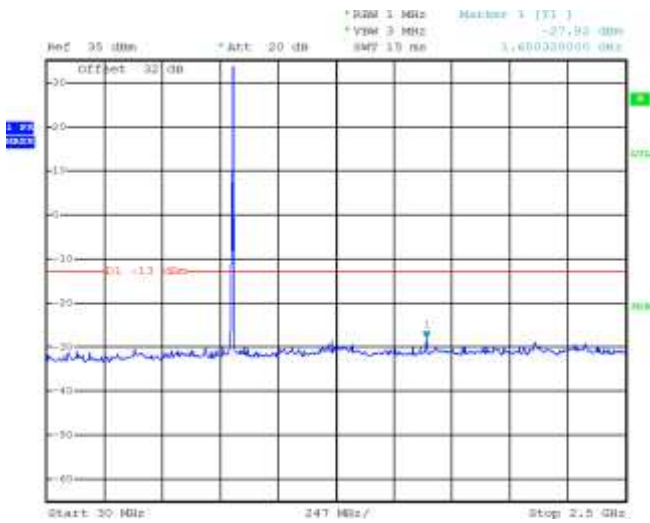
See Figures 1-35a to 1-38a for the plots of channel mask EDGE results.

See Figures 1-39a to 1-50a for the plots of the conducted spurious emissions EDGE results

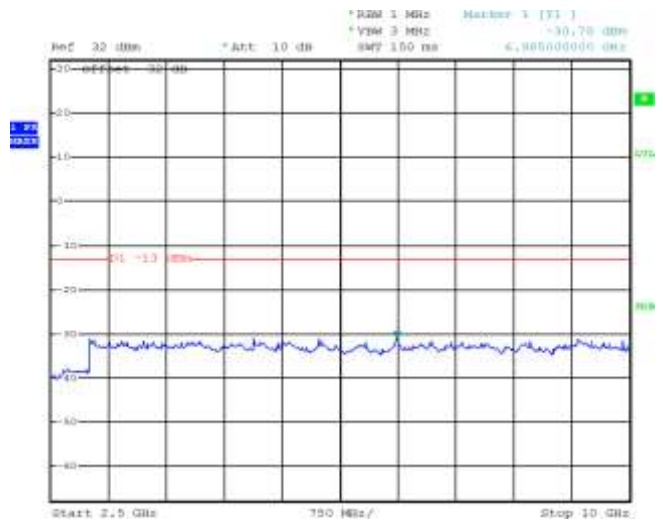
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

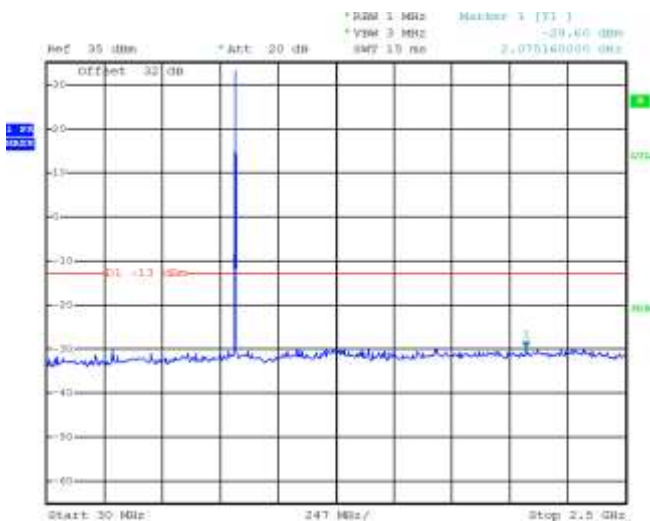
**Figure 1-a: GSM850 band, Spurious Conducted Emissions, Low channel**



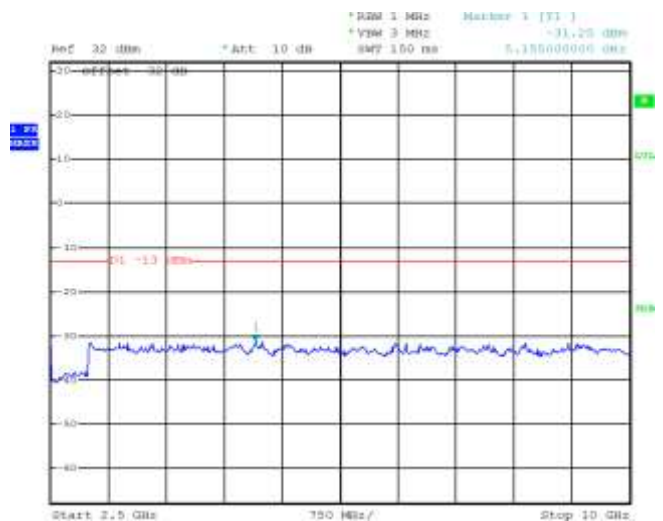
**Figure 1-1a: GSM850 band, Spurious Conducted Emissions, Low channel**



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



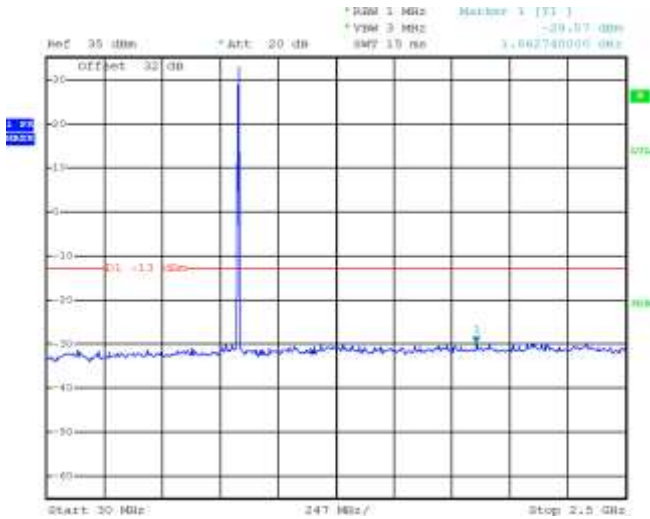
**Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel**



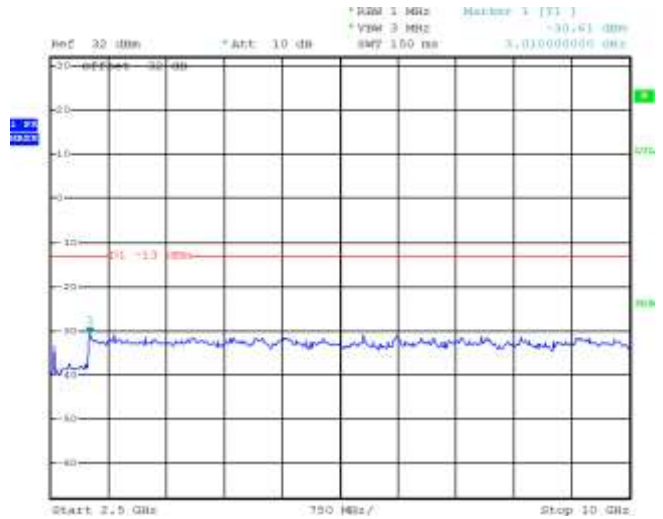
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

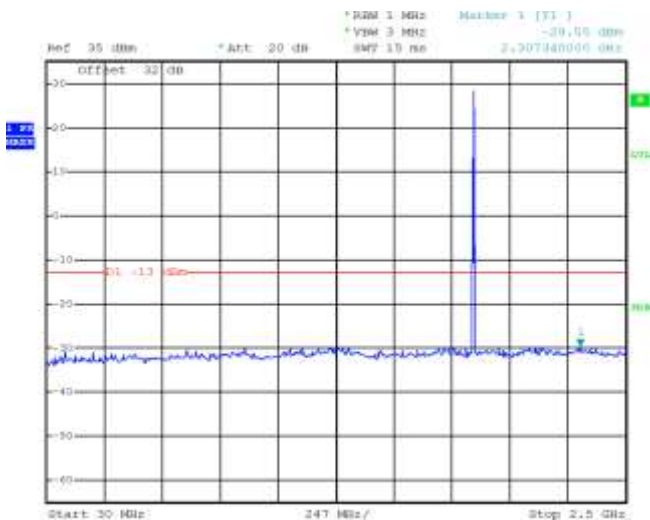
**Figure 1-4a: GSM850 band, Spurious Conducted Emissions, High Channel**



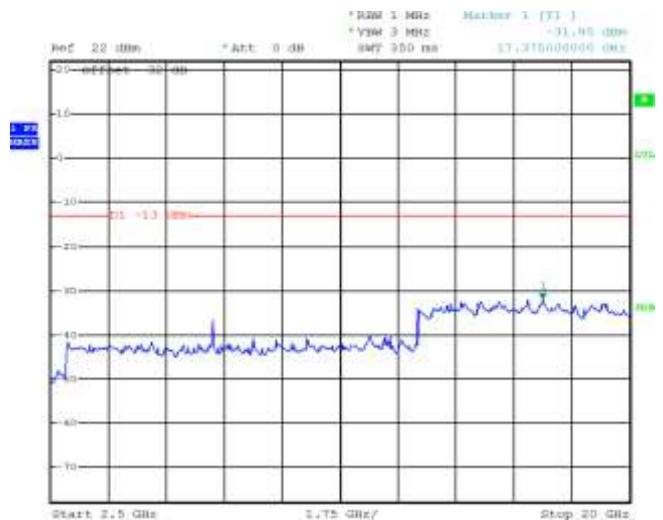
**Figure 1-5a: GSM850 band, Spurious Conducted Emissions, High Channel**



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



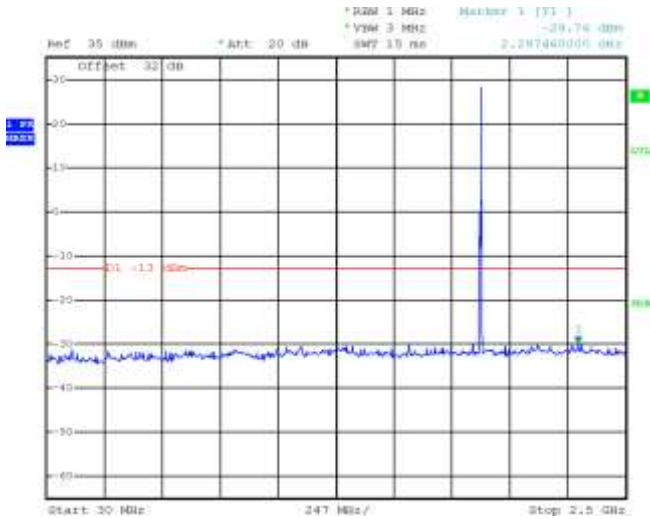
**Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel**



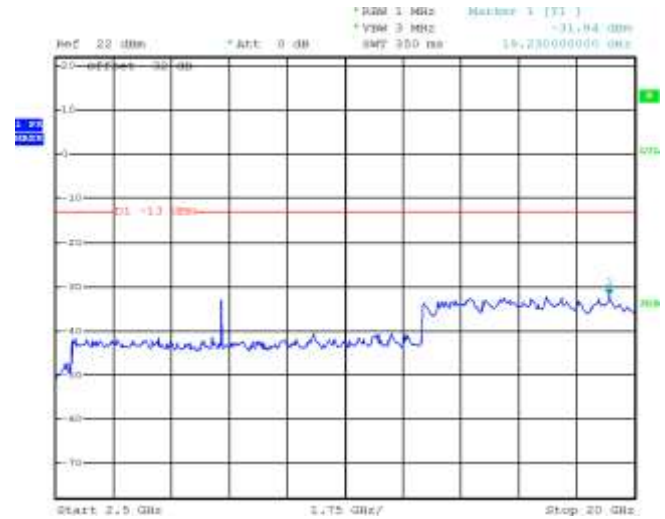
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

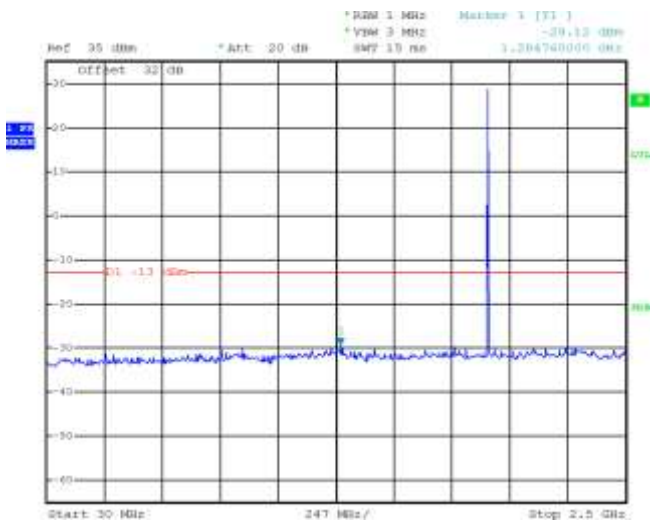
**Figure 1-9a: PCS1900 band, Spurious Conducted Emissions, Middle Channel**



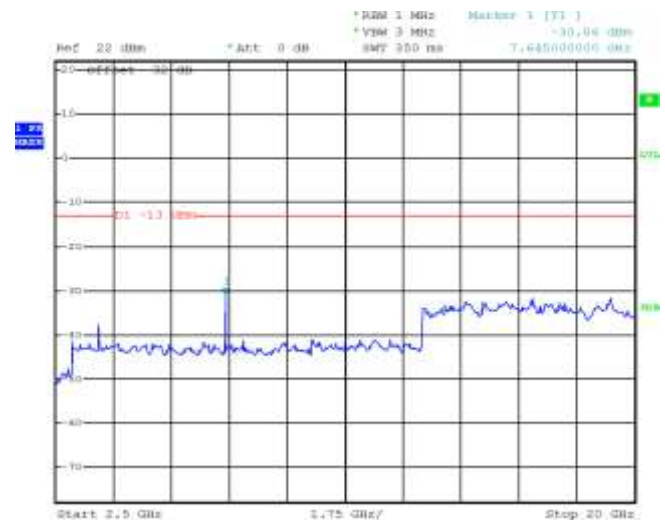
**Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel**



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



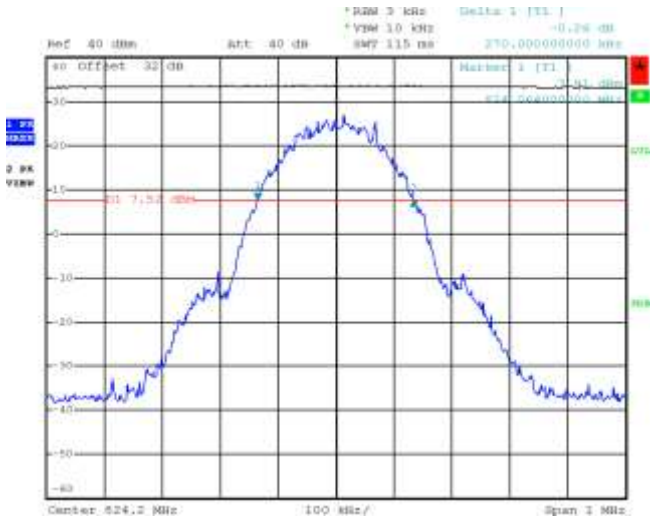
**Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel**



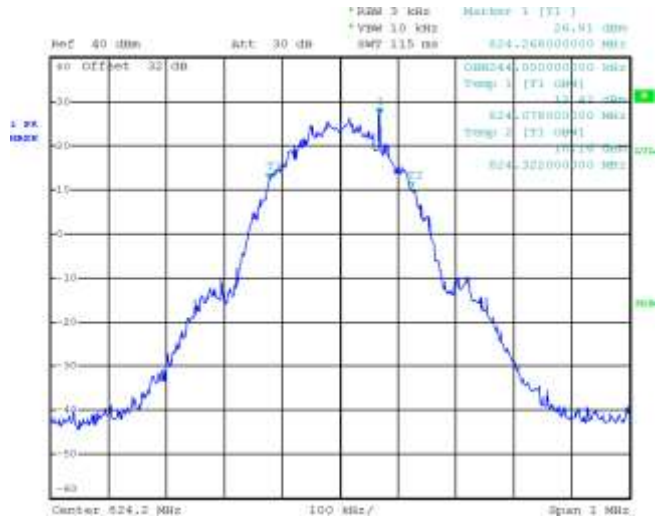
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

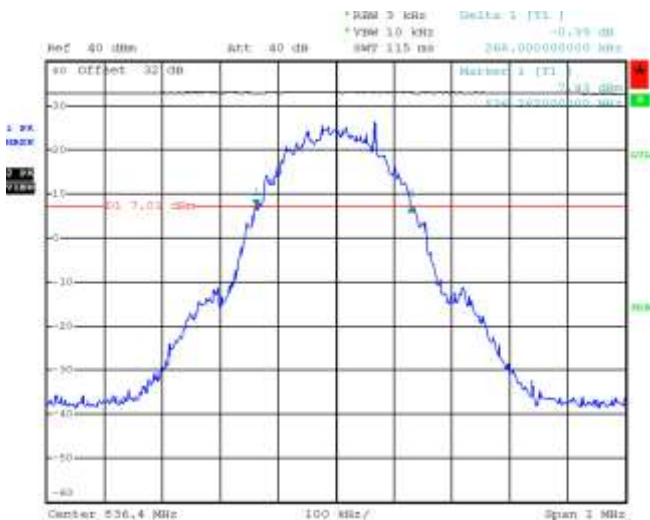
**Figure 1-13a: -26dBc bandwidth, GSM850 band Low Channel in GSM mode**



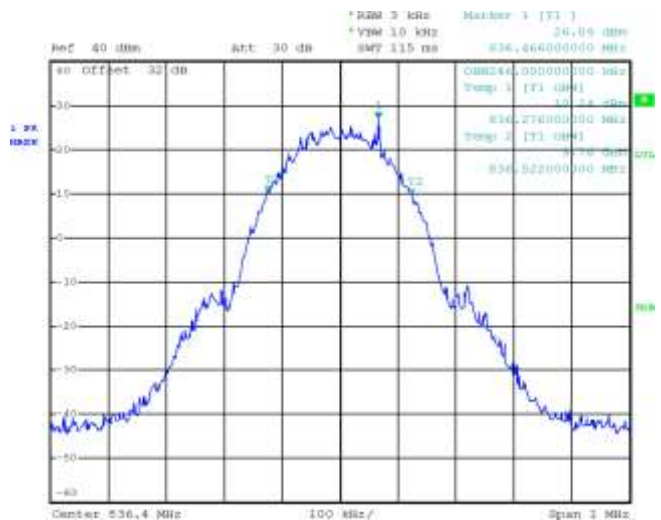
**Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode**



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



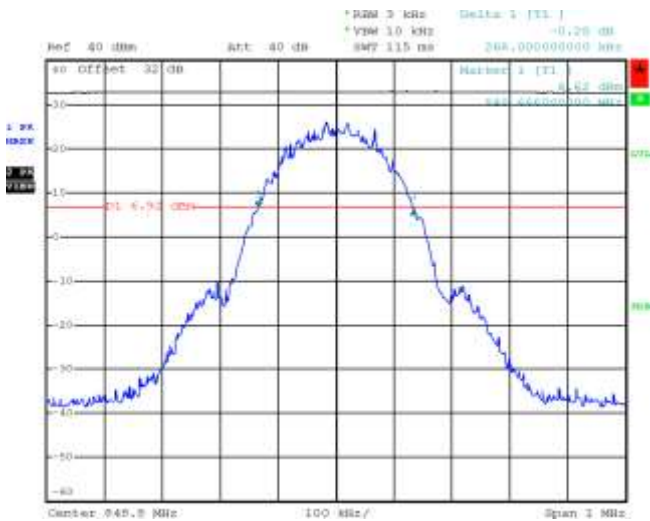
**Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode**



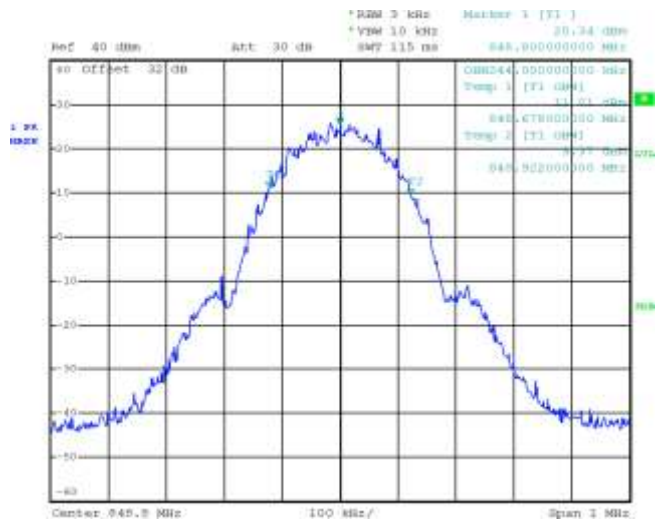
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

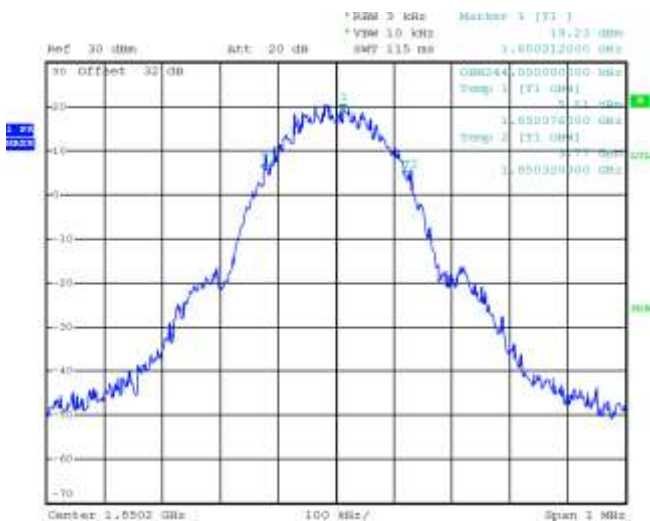
**Figure 1-17a: -26dBc bandwidth, GSM850 band High Channel in GSM mode**



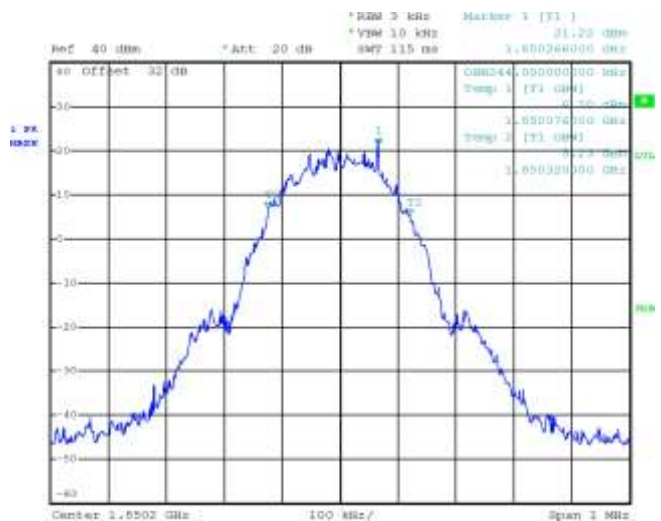
**Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode**



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



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

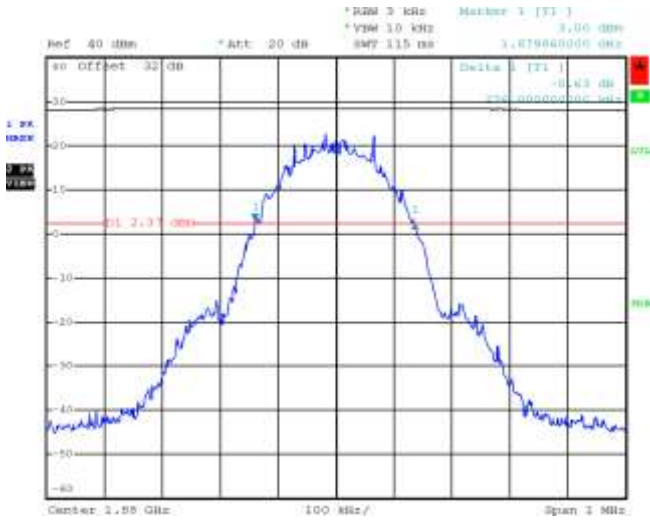




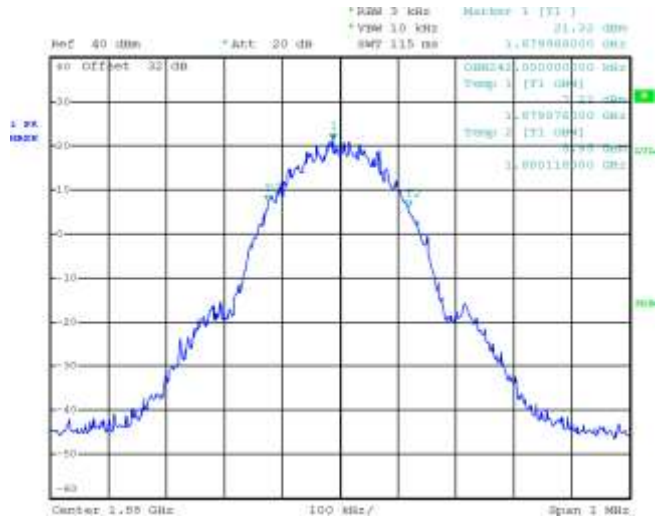
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

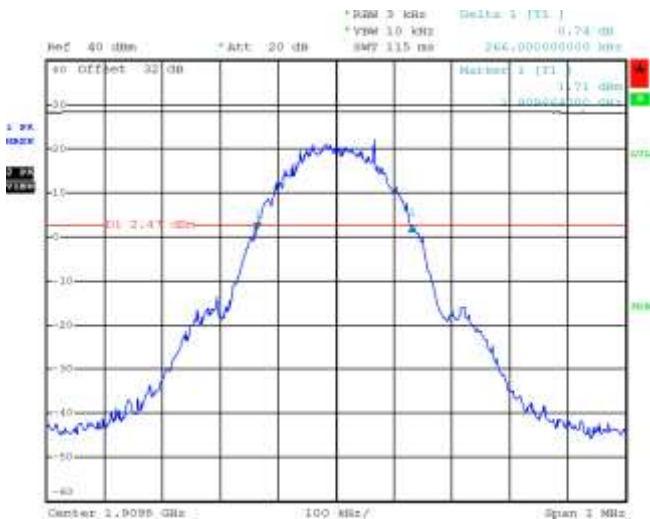
**Figure 1-21a: -26dBc bandwidth, PCS1900  
Middle Channel in GSM mode**



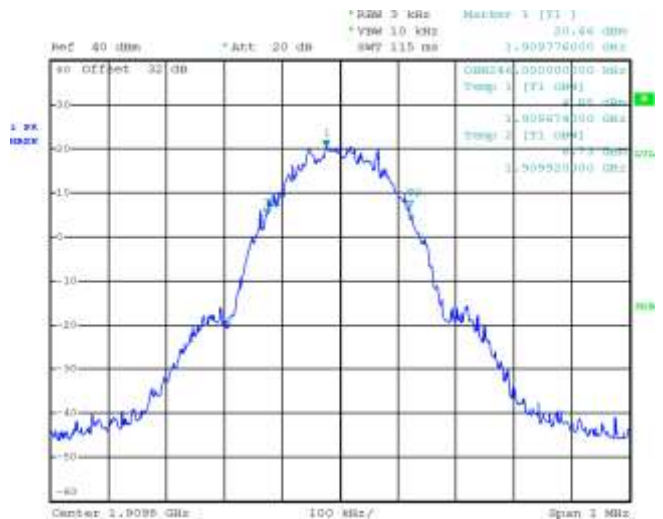
**Figure 1-22a: Occupied Bandwidth, PCS1900  
Middle Channel in GSM mode**



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



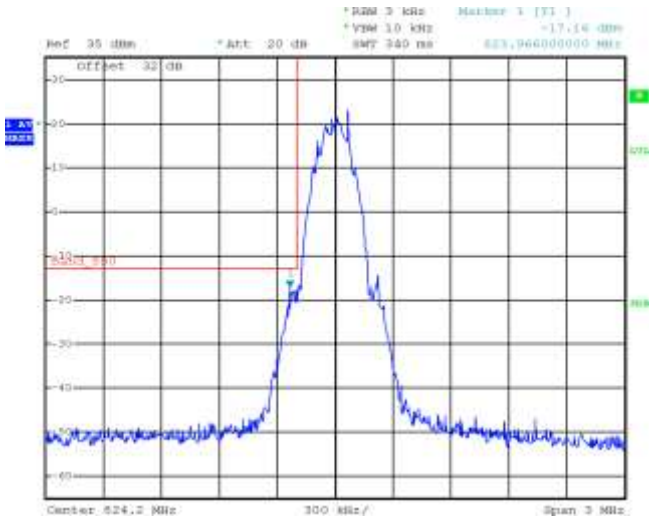
**Figure 1-24a: Occupied Bandwidth, PCS1900  
High Channel in GSM mode**



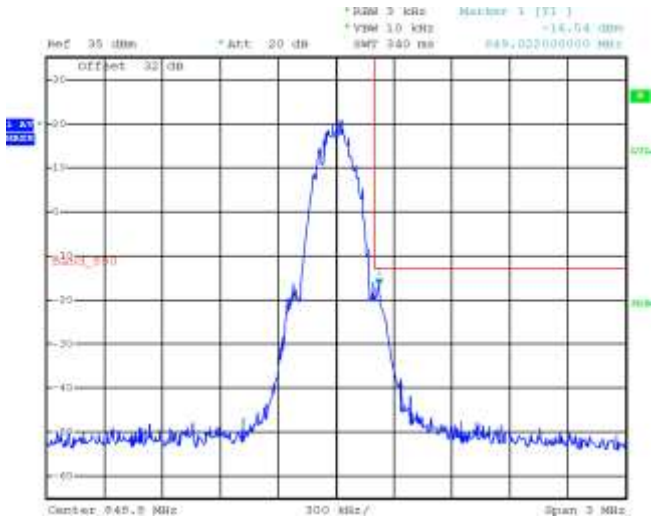
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

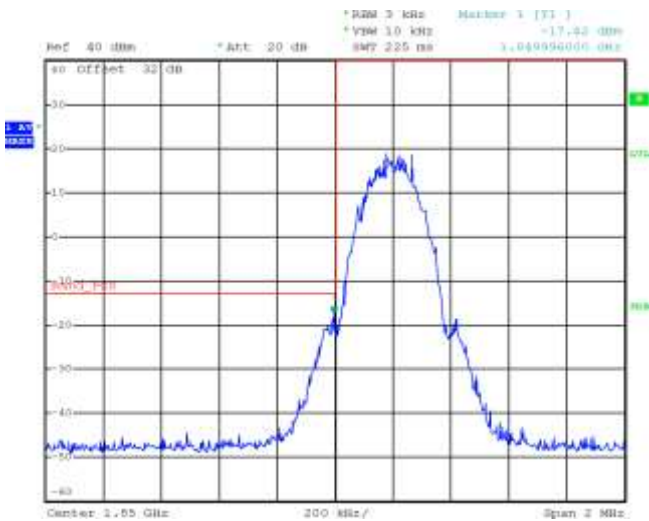
**Figure 1-25a: GSM850 band, Low Channel Mask in GSM mode**



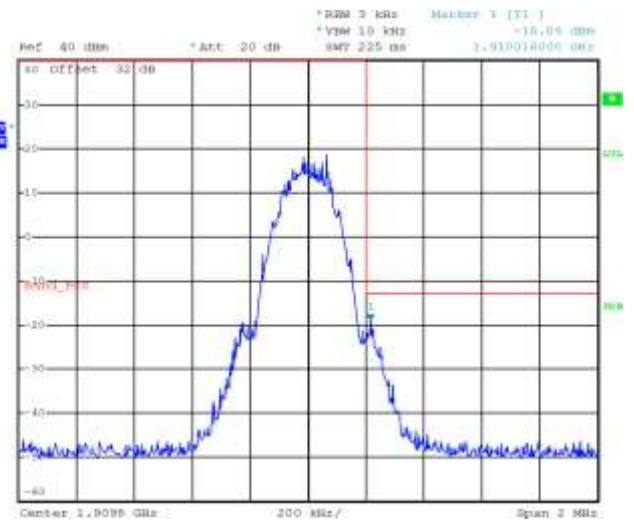
**Figure 1-26a: GSM850 band High Channel Mask in GSM mode**



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



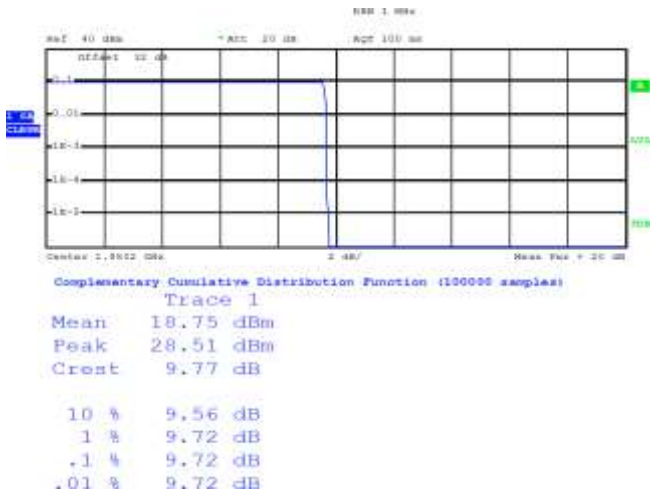
**Figure 1-28a: PCS1900, High Channel Mask in GSM mode**



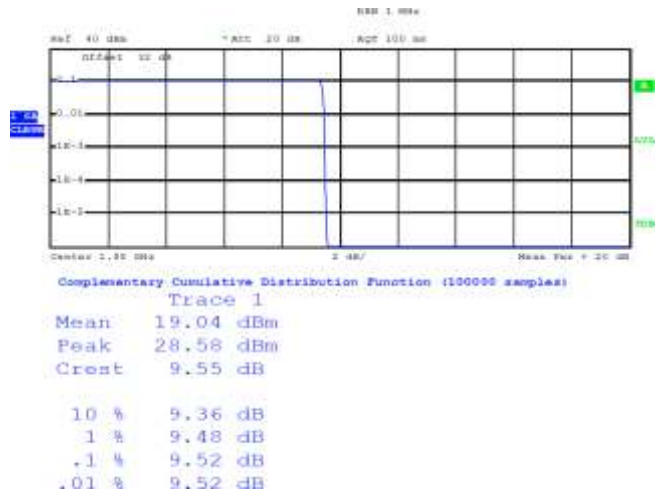
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

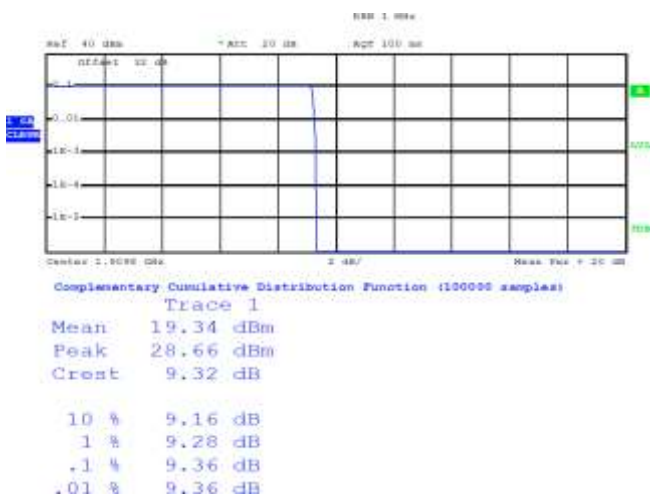
**Figure 1-51a: PCS1900 Band, PAR Low Channel**



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



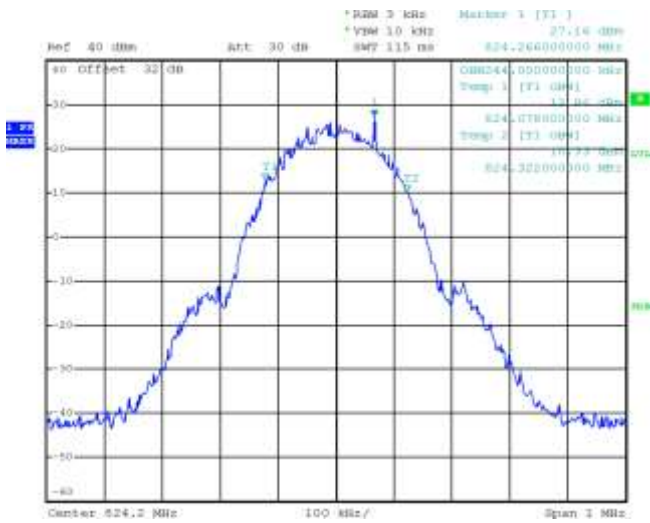
**Figure 1-53a: PCS1900 Band, PAR High Channel**



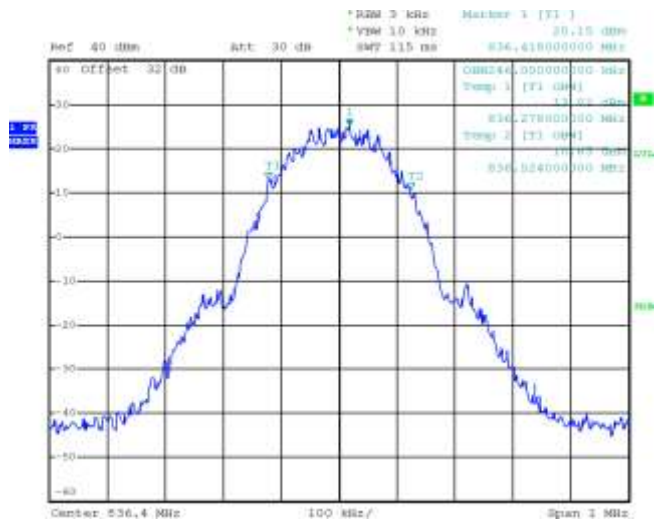
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

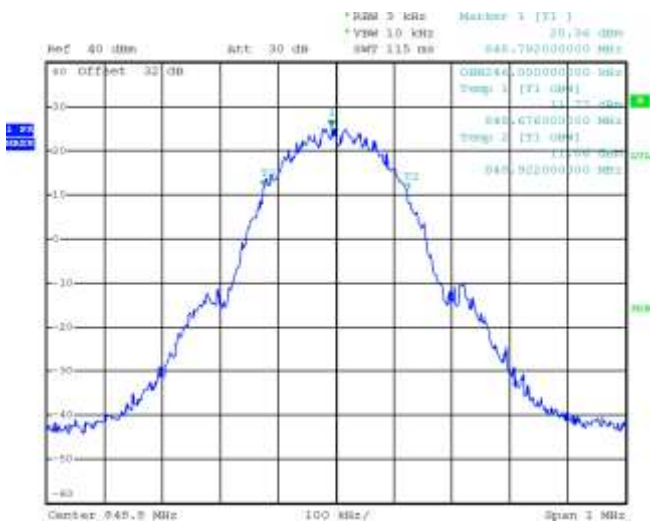
**Figure 1-29a: Occupied Bandwidth, GSM850 Band, Low Channel in EDGE mode**



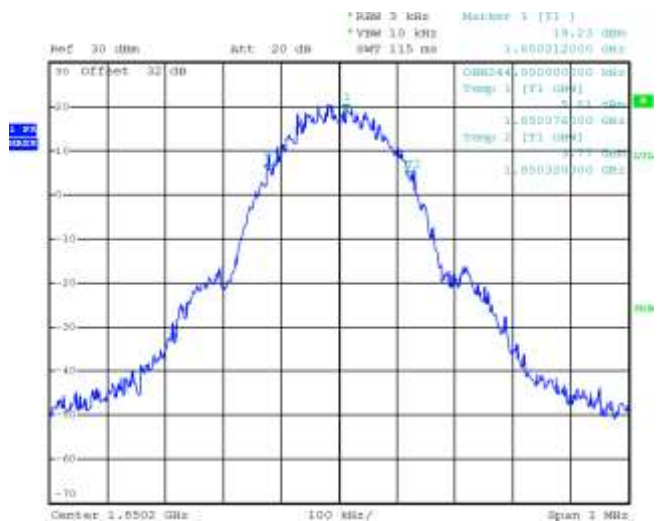
**Figure 1-30a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode**



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



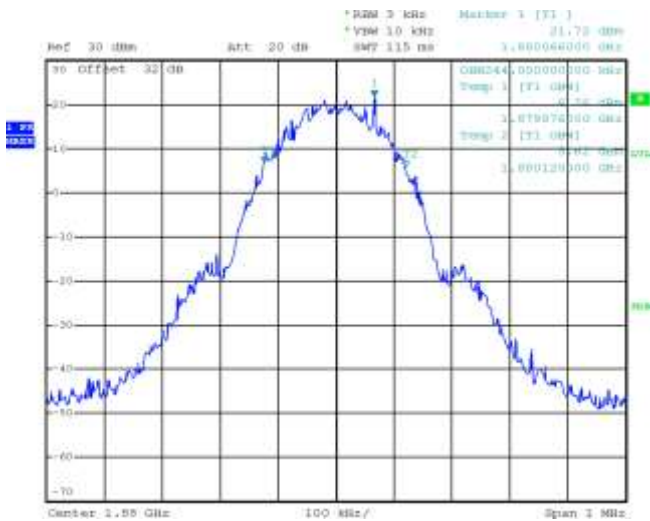
**Figure 1-32a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode**



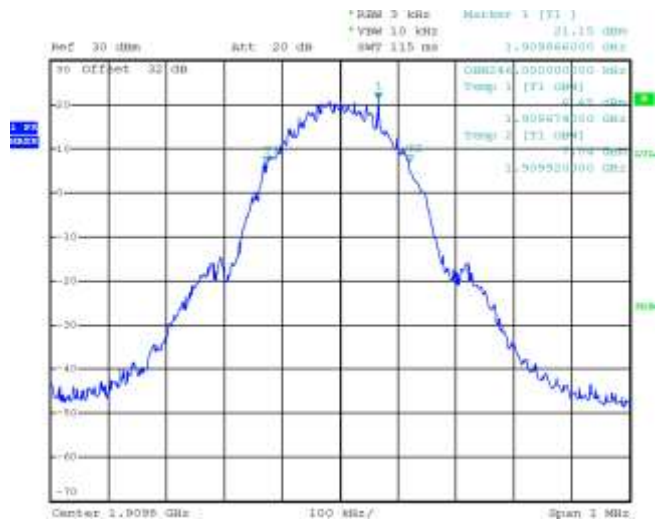
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

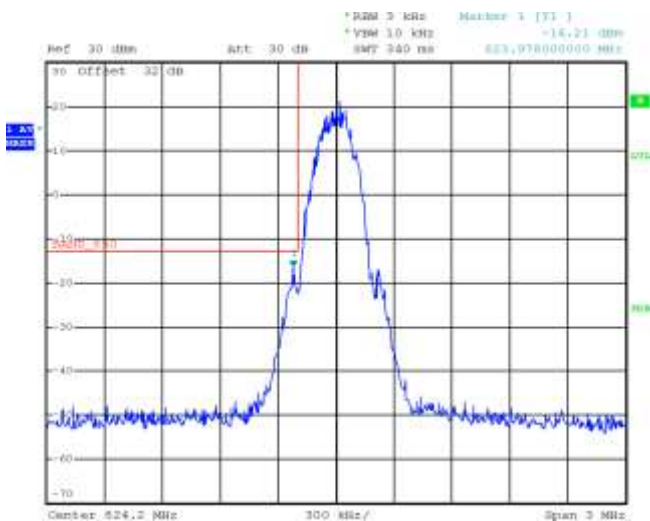
**Figure 1-33a: Occupied Bandwidth, PCS1900 Band, Middle Channel in EDGE mode**



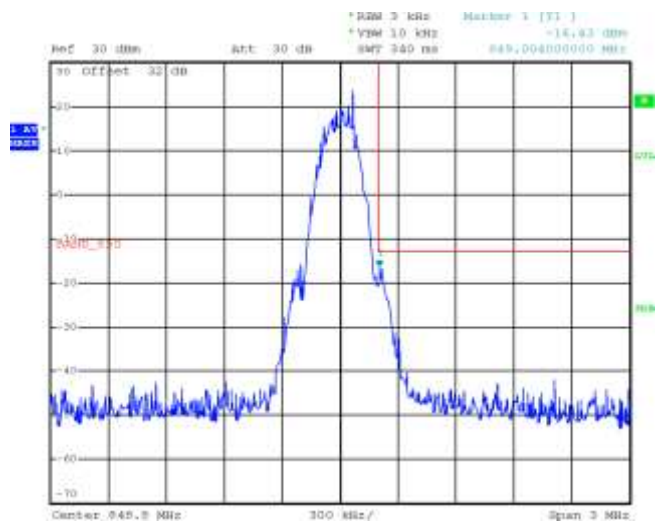
**Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode**



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



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

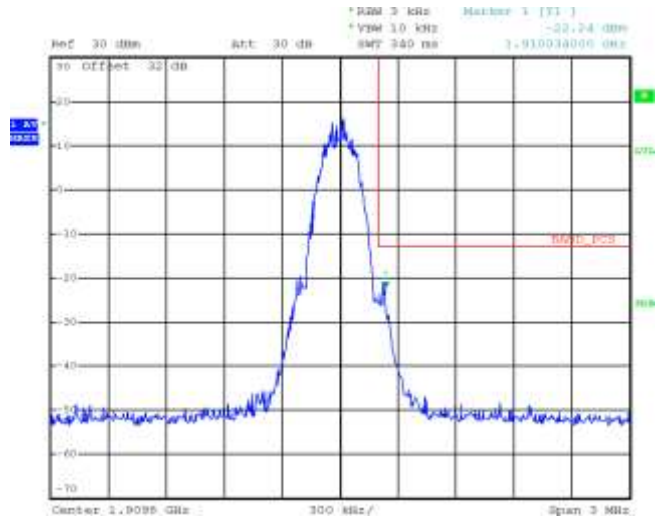
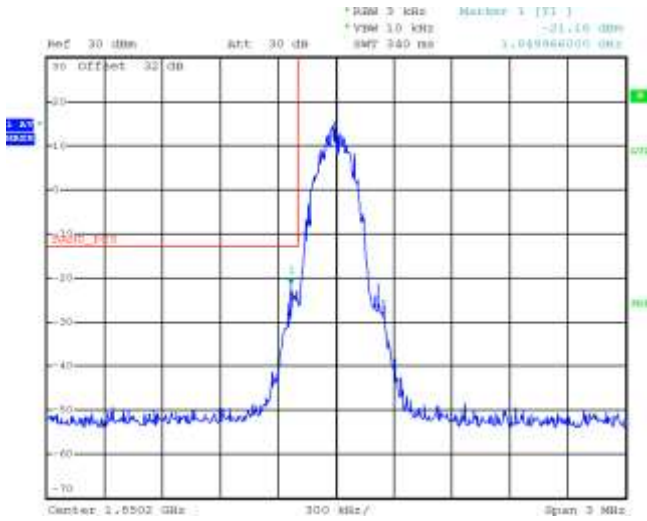


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

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

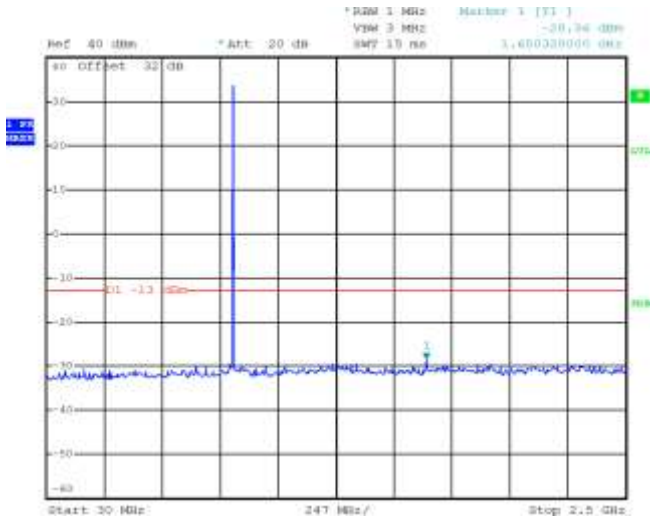
**Figure 1-38a: PCS1900 Band, High Channel Mask in EDGE mode**



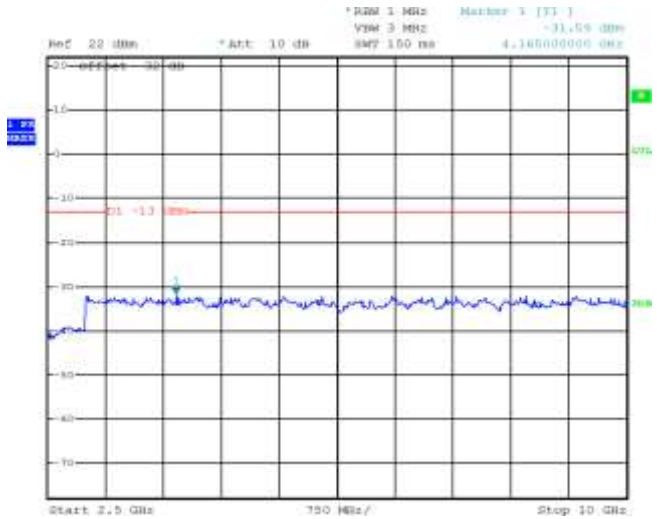
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

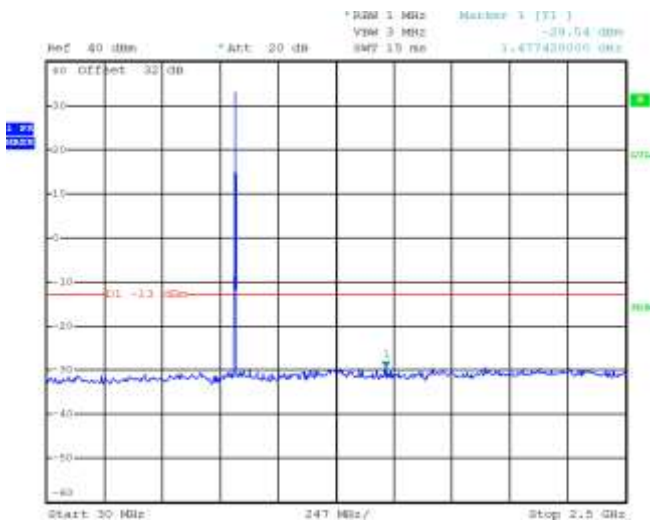
**Figure 1-39a: GSM850 band, Spurious Conducted Emissions, Low channel in Edge Mode**



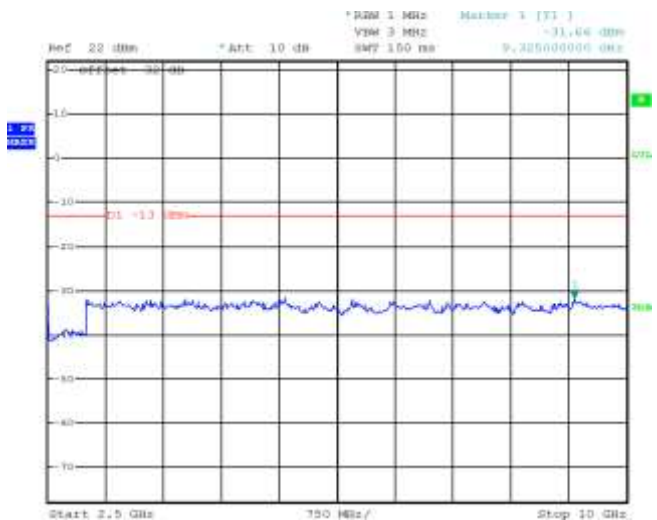
**Figure 1-40a: GSM850 band, Spurious Conducted Emissions, Low channel in Edge Mode**



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



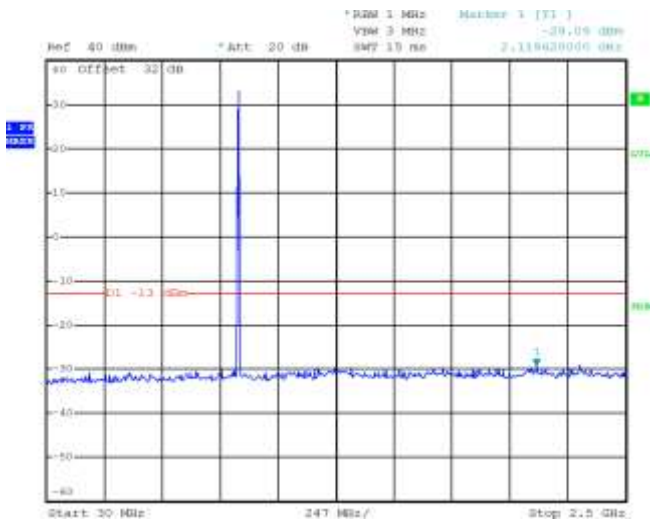
**Figure 1-42a: GSM850 band, Spurious Conducted Emissions, Middle channel in Edge Mode**



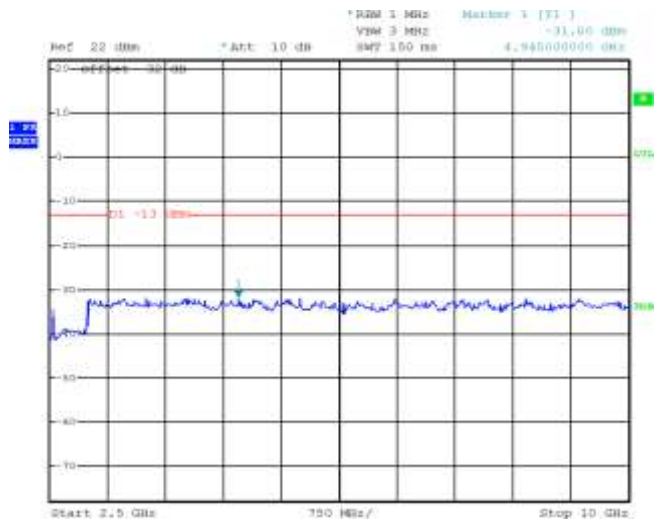
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

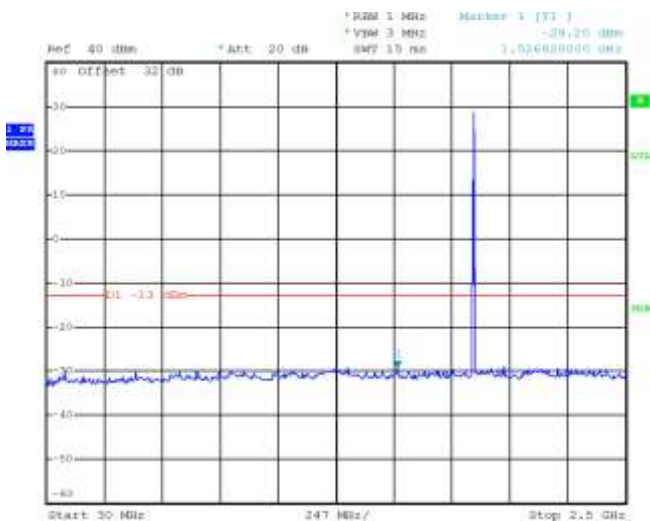
**Figure 1-43a: GSM850 band, Spurious Conducted Emissions, High channel in Edge Mode**



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



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



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

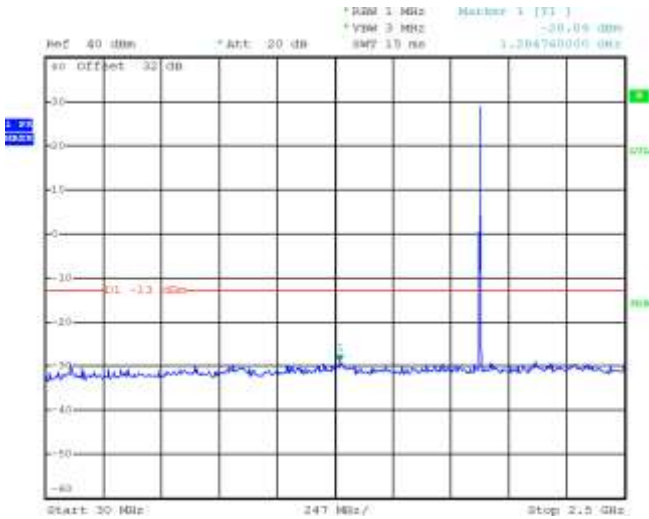




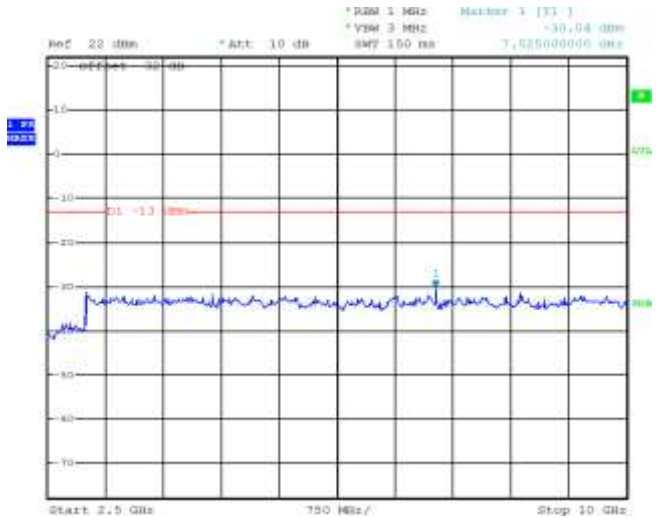
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

GSM Conducted RF Emission Test Data cont'd

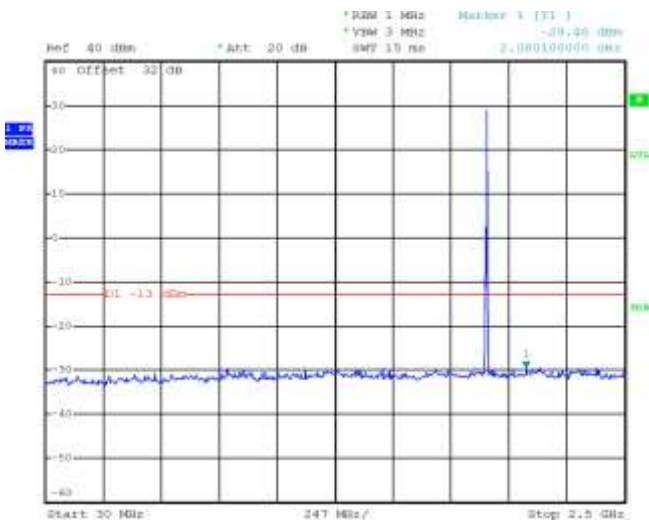
**Figure 1-47a: PCS1900 band, Spurious Conducted Emissions, middle channel in Edge Mode**



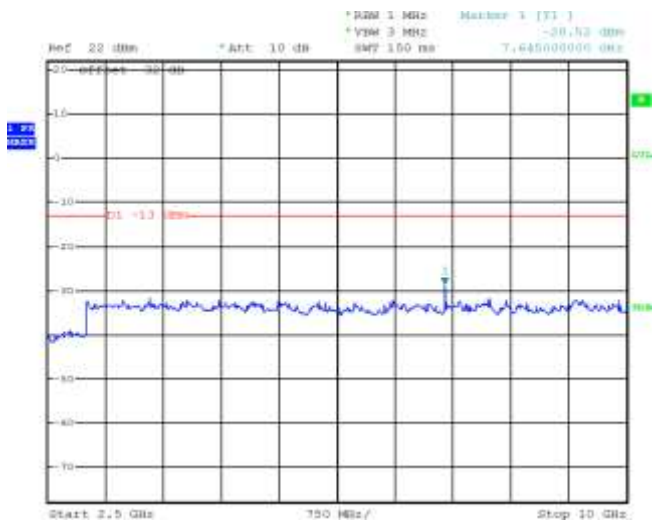
**Figure 1-48a: PCS1900 band, Spurious Conducted Emissions, middle channel in Edge Mode**



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



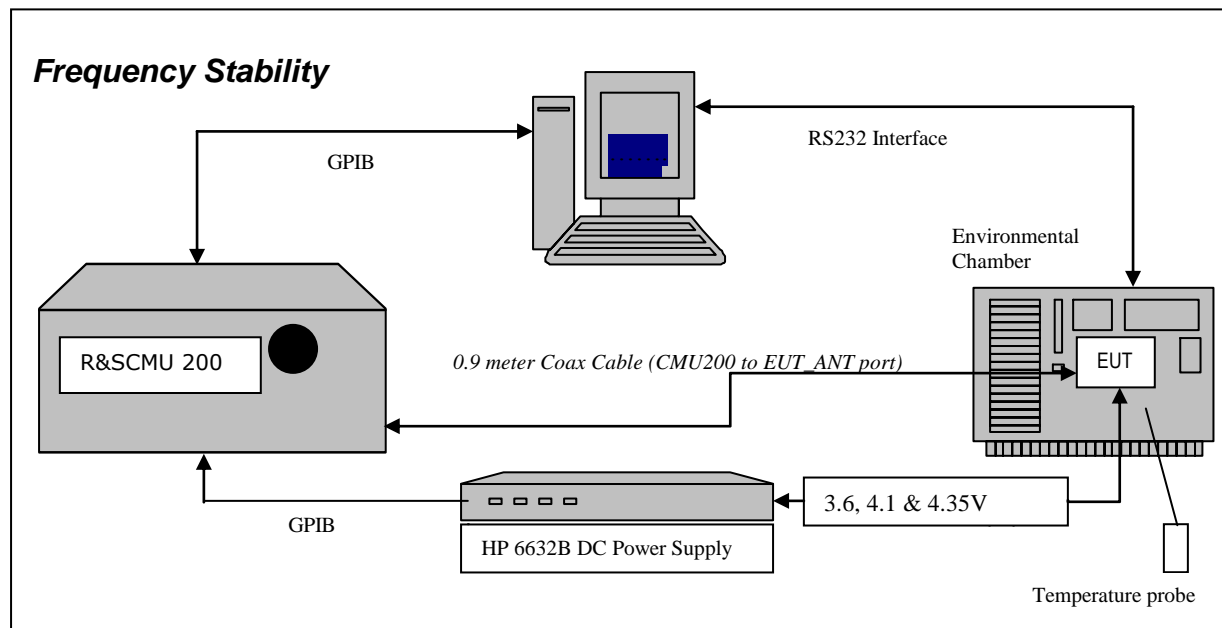
**Figure 1-50a: PCS1900 band, Spurious Conducted Emissions, High channel in Edge Mode**



## APPENDIX 1B – GSM FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### GSM Frequency Stability Test Data



The measurements were performed by Chuan Tran.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.995 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation

(d) Frequency Stability - Voltage Variation

#### **24.235** Frequency Stability.

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

*The EUT meets the requirements as stated in CFR 47 chapter 1, Section 24.235, CFR 47 chapter 1, Section 22.917 RSS-132, 4.3 Frequency Stability, 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 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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 **0.0324 PPM**.  
The maximum frequency error in the PCS1900 band measured was **0.0277 PPM**.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

Date of Test: August 23, 2013

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

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-12.40	-0.0150
189	836.40	3.6	20	-12.91	-0.0154
251	848.60	3.6	20	-15.11	-0.0178

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.1	20	-9.17	-0.0111
189	836.40	4.1	20	-8.52	-0.0102
251	848.60	4.1	20	-7.30	-0.0086

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.35	20	7.10	0.0086
189	836.40	4.35	20	-7.04	-0.0084
251	848.60	4.35	20	-5.75	-0.0068

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-20.28	-0.0246
128	824.20	3.6	-20	-7.68	-0.0093
128	824.20	3.6	-10	8.01	0.0097
128	824.20	3.6	0	15.82	0.0192
128	824.20	3.6	10	7.17	0.0087
128	824.20	3.6	20	-12.40	-0.0150
128	824.20	3.6	30	-7.62	-0.0092
128	824.20	3.6	40	20.60	0.0250
128	824.20	3.6	50	-4.84	-0.0059
128	824.20	3.6	60	5.42	0.0066
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.1	-30	-14.92	-0.0181
128	824.20	4.1	-20	-12.91	-0.0157
128	824.20	4.1	-10	14.21	0.0172
128	824.20	4.1	0	7.88	0.0096
128	824.20	4.1	10	9.17	0.0111
128	824.20	4.1	20	-9.17	-0.0111
128	824.20	4.1	30	-11.17	-0.0136
128	824.20	4.1	40	19.37	0.0235
128	824.20	4.1	50	-5.42	-0.0066
128	824.20	4.1	60	4.65	0.0056
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.35	-30	-24.73	-0.0300
128	824.20	4.35	-20	-11.49	-0.0139
128	824.20	4.35	-10	14.79	0.0179
128	824.20	4.35	0	10.33	0.0125
128	824.20	4.35	10	8.46	0.0103
128	824.20	4.35	20	7.10	0.0086
128	824.20	4.35	30	-13.56	-0.0165
128	824.20	4.35	40	16.40	0.0199
128	824.20	4.35	50	4.97	0.0060
128	824.20	4.35	60	-12.14	-0.0147

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-20.21	-0.0242
189	836.40	3.6	-20	-5.23	-0.0063
189	836.40	3.6	-10	14.53	0.0174
189	836.40	3.6	0	19.05	0.0228
189	836.40	3.6	10	7.88	0.0094
189	836.40	3.6	20	-12.91	-0.0154
189	836.40	3.6	30	-10.14	-0.0121
189	836.40	3.6	40	<b>27.12</b>	<b>0.0324</b>
189	836.40	3.6	50	6.91	0.0083
189	836.40	3.6	60	-10.53	-0.0126
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.1	-30	-17.69	-0.0212
189	836.40	4.1	-20	-9.94	-0.0119
189	836.40	4.1	-10	17.76	0.0212
189	836.40	4.1	0	9.69	0.0116
189	836.40	4.1	10	9.81	0.0117
189	836.40	4.1	20	-8.52	-0.0102
189	836.40	4.1	30	-16.14	-0.0193
189	836.40	4.1	40	22.92	0.0274
189	836.40	4.1	50	4.91	0.0059
189	836.40	4.1	60	-7.94	-0.0095
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	4.35	-30	-25.05	-0.0299
189	836.40	4.35	-20	-5.88	-0.0070
189	836.40	4.35	-10	16.27	0.0195
189	836.40	4.35	0	9.88	0.0118
189	836.40	4.35	10	8.14	0.0097
189	836.40	4.35	20	-7.04	-0.0084
189	836.40	4.35	30	-18.60	-0.0222
189	836.40	4.35	40	16.59	0.0198
189	836.40	4.35	50	5.81	0.0069
189	836.40	4.35	60	-12.66	-0.0151



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-5.88	-0.0069
251	848.8	3.6	-20	-7.94	-0.0094
251	848.8	3.6	-10	12.01	0.0141
251	848.8	3.6	0	20.60	0.0243
251	848.8	3.6	10	10.20	0.0120
251	848.8	3.6	20	-15.11	-0.0178
251	848.8	3.6	30	-7.23	-0.0085
251	848.8	3.6	40	25.83	0.0304
251	848.8	3.6	50	5.23	0.0062
251	848.8	3.6	60	-9.17	-0.0108
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	4.1	-30	-14.85	-0.0175
251	848.8	4.1	-20	-9.94	-0.0117
251	848.8	4.1	-10	16.14	0.0190
251	848.8	4.1	0	14.85	0.0175
251	848.8	4.1	10	7.49	0.0088
251	848.8	4.1	20	-7.30	-0.0086
251	848.8	4.1	30	-8.14	-0.0096
251	848.8	4.1	40	22.21	0.0262
251	848.8	4.1	50	6.46	0.0076
251	848.8	4.1	60	-9.04	-0.0107
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	4.35	-30	-8.27	-0.0097
251	848.8	4.35	-20	-7.62	-0.0090
251	848.8	4.35	-10	14.85	0.0175
251	848.8	4.35	0	7.81	0.0092
251	848.8	4.35	10	10.91	0.0129
251	848.8	4.35	20	-5.75	-0.0068
251	848.8	4.35	30	18.14	0.0214
251	848.8	4.35	40	14.85	0.0175
251	848.8	4.35	50	4.78	0.0056
251	848.8	4.35	60	-9.56	-0.0113

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	26.02	0.0141
661	1880.00	3.6	20	31.06	0.0165
810	1909.80	3.6	20	31.96	0.0167

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.1	20	29.25	0.0158
661	1880.00	4.1	20	28.28	0.0150
810	1909.80	4.1	20	24.80	0.0130

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.35	20	24.60	0.0133
661	1880.00	4.35	20	28.09	0.0149
810	1909.80	4.35	20	24.60	0.0129

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-8.46	-0.0046
512	1850.20	3.6	-20	16.79	0.0091
512	1850.20	3.6	-10	22.73	0.0123
512	1850.20	3.6	0	46.94	0.0254
512	1850.20	3.6	10	40.36	0.0218
512	1850.20	3.6	20	26.02	0.0141
512	1850.20	3.6	30	32.54	0.0176
512	1850.20	3.6	40	26.09	0.0141
512	1850.20	3.6	50	25.57	0.0138
512	1850.20	3.6	60	20.86	0.0113
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.1	-30	-17.69	-0.0096
512	1850.20	4.1	-20	7.49	0.0040
512	1850.20	4.1	-10	17.95	0.0097
512	1850.20	4.1	0	<b>51.21</b>	<b>0.0277</b>
512	1850.20	4.1	10	35.97	0.0194
512	1850.20	4.1	20	29.25	0.0158
512	1850.20	4.1	30	32.03	0.0173
512	1850.20	4.1	40	25.76	0.0139
512	1850.20	4.1	50	21.11	0.0114
512	1850.20	4.1	60	14.40	0.0078
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.35	-30	-24.34	-0.0132
512	1850.20	4.35	-20	7.81	0.0042
512	1850.20	4.35	-10	18.47	0.0100
512	1850.20	4.35	0	44.81	0.0242
512	1850.20	4.35	10	36.03	0.0195
512	1850.20	4.35	20	24.60	0.0133
512	1850.20	4.35	30	32.61	0.0176
512	1850.20	4.35	40	24.54	0.0133
512	1850.20	4.35	50	23.18	0.0125
512	1850.20	4.35	60	8.01	0.0043

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-10.98	-0.0058
661	1880.00	3.6	-20	20.34	0.0108
661	1880.00	3.6	-10	21.37	0.0114
661	1880.00	3.6	0	50.30	0.0268
661	1880.00	3.6	10	39.58	0.0211
661	1880.00	3.6	20	31.06	0.0165
661	1880.00	3.6	30	32.35	0.0172
661	1880.00	3.6	40	28.28	0.0150
661	1880.00	3.6	50	24.67	0.0131
661	1880.00	3.6	60	20.40	0.0109
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	4.1	-30	-9.75	-0.0052
661	1880.00	4.1	-20	-9.04	-0.0048
661	1880.00	4.1	-10	19.69	0.0105
661	1880.00	4.1	0	48.75	0.0259
661	1880.00	4.1	10	37.45	0.0199
661	1880.00	4.1	20	28.28	0.0150
661	1880.00	4.1	30	38.03	0.0202
661	1880.00	4.1	40	28.09	0.0149
661	1880.00	4.1	50	26.47	0.0141
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	-16.08	-0.0086
661	1880.00	4.35	-20	7.68	0.0041
661	1880.00	4.35	-10	19.05	0.0101
661	1880.00	4.35	0	44.62	0.0237
661	1880.00	4.35	10	36.22	0.0193
661	1880.00	4.35	20	28.09	0.0149
661	1880.00	4.35	30	34.61	0.0184
661	1880.00	4.35	40	21.50	0.0114
661	1880.00	4.35	50	19.82	0.0105
661	1880.00	4.35	60	-7.17	-0.0038

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 1B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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	-13.50	-0.0071
810	1909.80	3.6	-20	15.05	0.0079
810	1909.80	3.6	-10	20.15	0.0106
810	1909.80	3.6	0	51.21	0.0268
810	1909.80	3.6	10	42.94	0.0225
810	1909.80	3.6	20	31.96	0.0167
810	1909.80	3.6	30	36.68	0.0192
810	1909.80	3.6	40	31.58	0.0165
810	1909.80	3.6	50	30.99	0.0162
810	1909.80	3.6	60	24.28	0.0127
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	4.1	-30	-24.99	-0.0131
810	1909.80	4.1	-20	8.72	0.0046
810	1909.80	4.1	-10	20.02	0.0105
810	1909.80	4.1	0	47.20	0.0247
810	1909.80	4.1	10	33.51	0.0175
810	1909.80	4.1	20	24.80	0.0130
810	1909.80	4.1	30	42.62	0.0223
810	1909.80	4.1	40	29.96	0.0157
810	1909.80	4.1	50	28.09	0.0147
810	1909.80	4.1	60	12.46	0.0065
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	4.35	-30	-17.69	-0.0093
810	1909.80	4.35	-20	8.65	0.0045
810	1909.80	4.35	-10	11.95	0.0063
810	1909.80	4.35	0	42.88	0.0225
810	1909.80	4.35	10	35.19	0.0184
810	1909.80	4.35	20	24.60	0.0129
810	1909.80	4.35	30	32.09	0.0168
810	1909.80	4.35	40	22.28	0.0117
810	1909.80	4.35	50	22.15	0.0116
810	1909.80	4.35	60	-5.04	-0.0026

APPENDIX 2A– WCDMA Band II/IV/V CONDUCTED RF EMISSIONS TEST DATA/PLOTS



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### WCDMA Conducted RF Emission Test Data cont'd

**The conducted spurious emissions** – As per 47 CFR 2.1051, CFR 22.917, CFR 24.238(a), RSS-132, 5.5 and RSS – 133, 6.5 were measured from 30 MHz to 20 GHz.

#### **–26 dBc Bandwidth and Occupied Bandwidth (99%)**

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

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

The worst case –26dBc bandwidth for WCDMA Band V was measured to be 4.580 MHz, and for the WCDMA Band II was measured to be 4.600 MHz as shown below. Results were derived in a 100 kHz resolution bandwidth.

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

#### Test Data for WCDMA Band II/IV/V selected Frequencies in Voice mode

The following tests were performed on model RGE111LW.

WCDMA Band V Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.580	<b>4.165</b>
836.400	4.570	<b>4.165</b>
846.600	4.570	<b>4.165</b>

The following tests were performed on model RGF111LW.

WCDMA Band II Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.600	<b>4.180</b>
1880.000	4.600	4.170
1907.600	4.600	<b>4.180</b>

WCDMA Band IV Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1712.4	4.570	4.170
1732.6	4.590	4.180
1752.6	4.580	<b>4.190</b>



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### Peak to Average Ratio (PAR)

The peak to average ratio was measured on the low, middle and high channels. On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied. The worst case measured was 6.71 dB on the low channel of WCDMA Band II. The worst case measured was 6.81 dB on low and high channels of WCDMA Band IV.

### Measurement Plots for WCDMA Band II/IV/V Voice mode

The measurement plots on product RGF121LW:  
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 II).

The measurement plots on product RGF111LW:  
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 IV).

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### **Test Data for WCDMA Band II/IV/V selected Frequencies in HSUPA mode**

The following tests were performed on model RGE111LW.

<b>WCDMA Band V Frequency (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>
826.400	<b>4.175</b>
836.400	4.170
846.600	4.170

The following tests were performed on model RGE111LW.

<b>WCDMA Band II Frequency (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>
1852.400	<b>4.170</b>
1880.000	<b>4.170</b>
1907.600	<b>4.170</b>

<b>WCDMA Band IV Frequency (MHz)</b>	<b>99% Occupied Bandwidth (MHz)</b>
1712.4	4.170
1732.6	<b>4.180</b>
1752.6	<b>4.180</b>

#### ***Measurement Plots for WCDMA Band V/2/4 in HSUPA mode***

Refer to the following measurement plots for more detail:

The measurement plots for product RFW121LW:

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 RFY111LW:

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

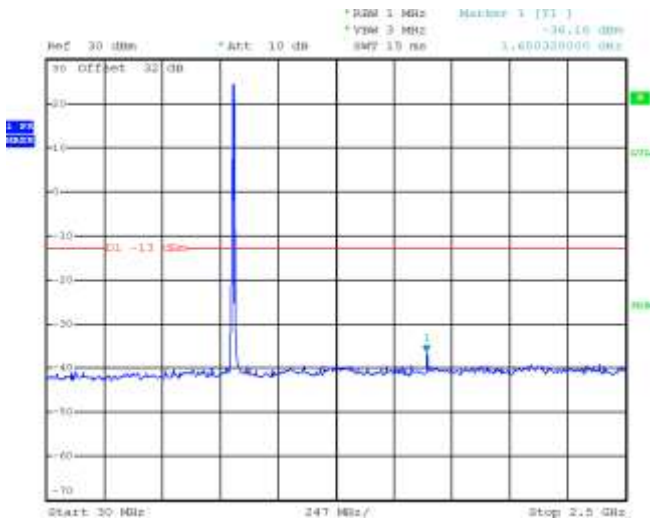
See Figures 2-24b to 2-26b for the plots of 99% Occupied Bandwidth.

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

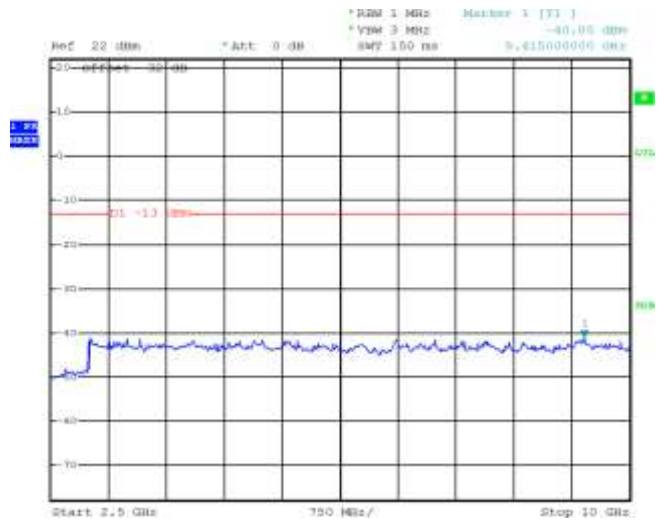
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

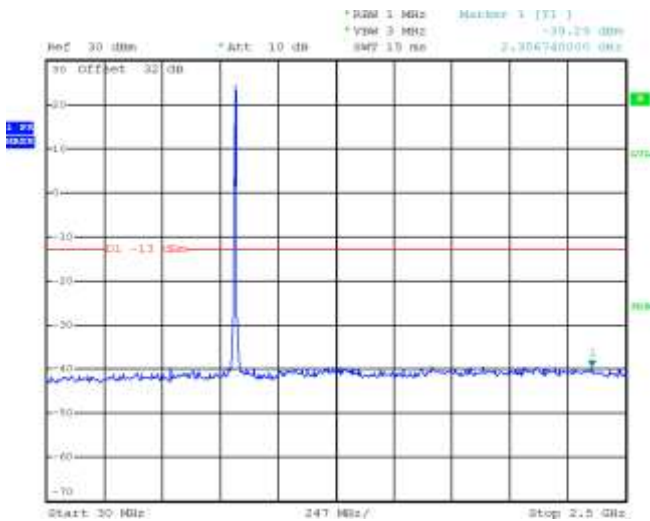
**Figure 2-1a: Band V, Spurious Conducted Emissions, Low channel**



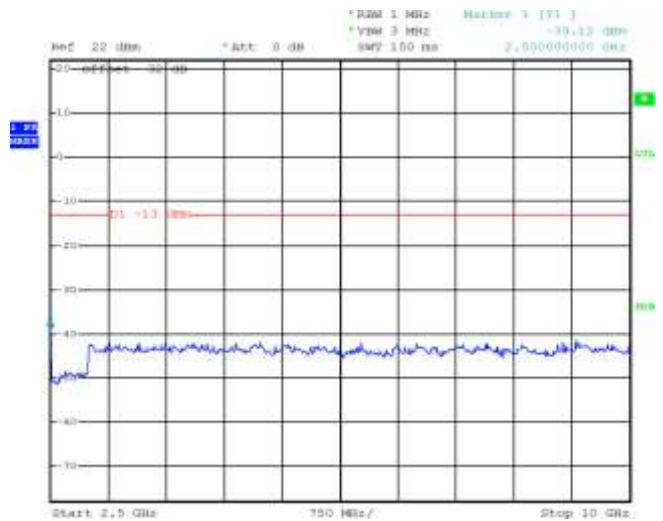
**Figure 2-2a: Band V, Spurious Conducted Emissions, Low channel**



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



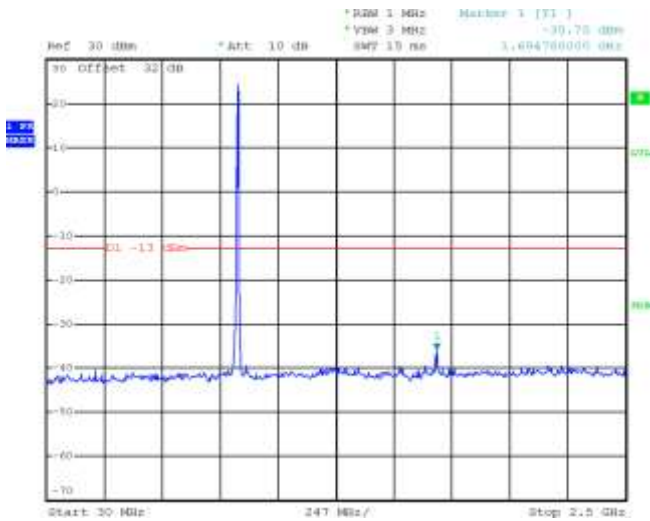
**Figure 2-4a: Band V, Spurious Conducted Emissions, Middle channel**



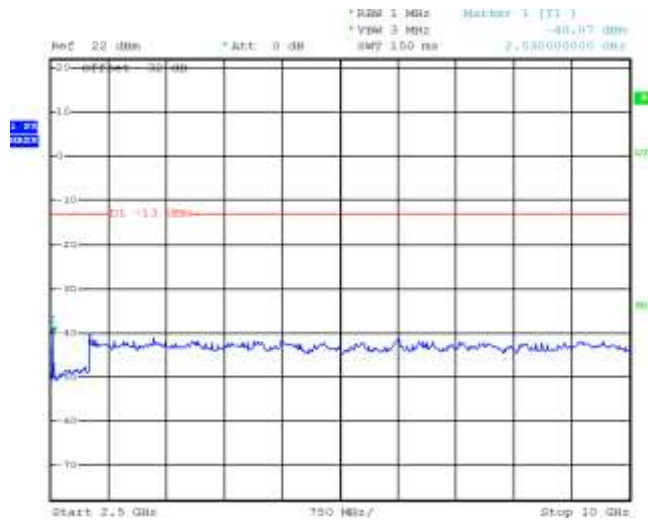
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

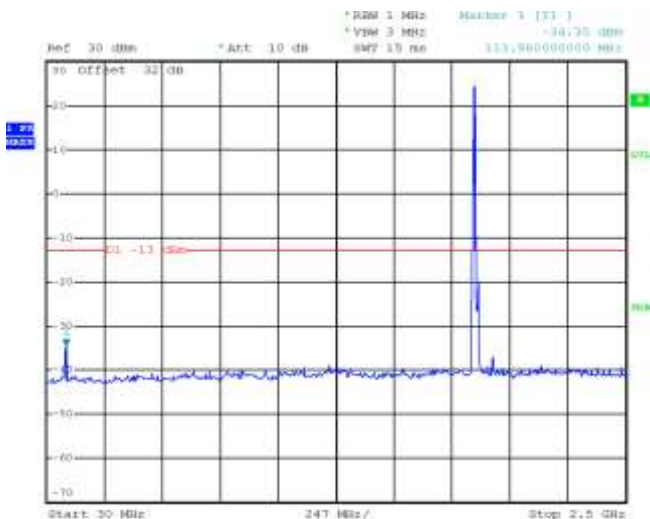
**Figure 2-5a: Band V, Spurious Conducted Emissions, High Channel**



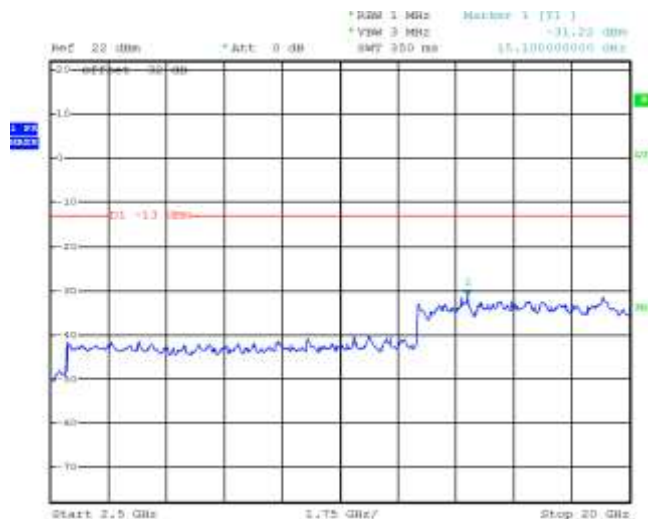
**Figure 2-6a: Band V, Spurious Conducted Emissions, High Channel**



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



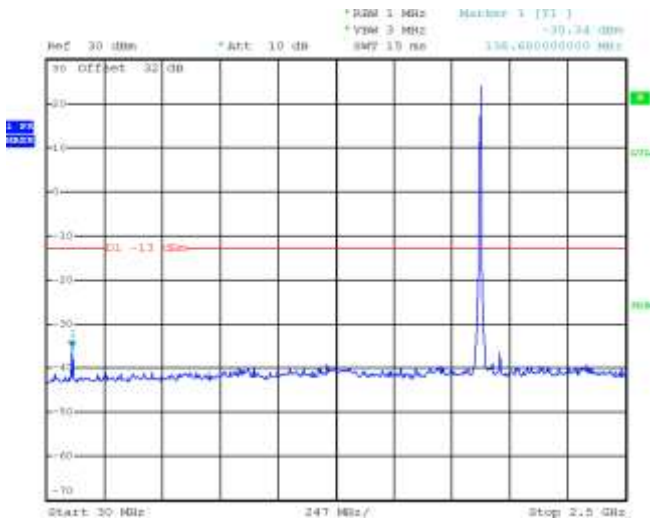
**Figure 2-8a: BAND II, Spurious Conducted Emissions, Low Channel**



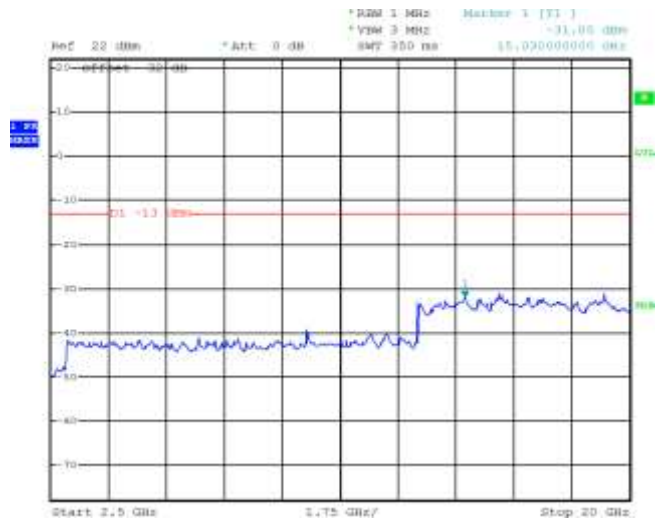
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

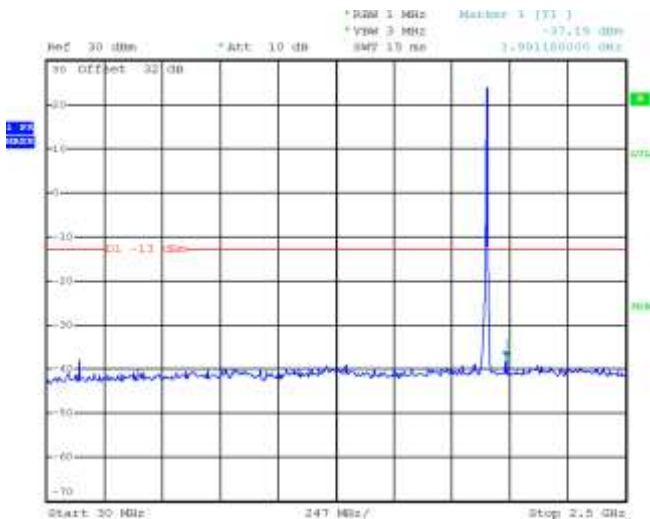
**Figure 2-9a: BAND II, Spurious Conducted Emissions, Middle Channel**



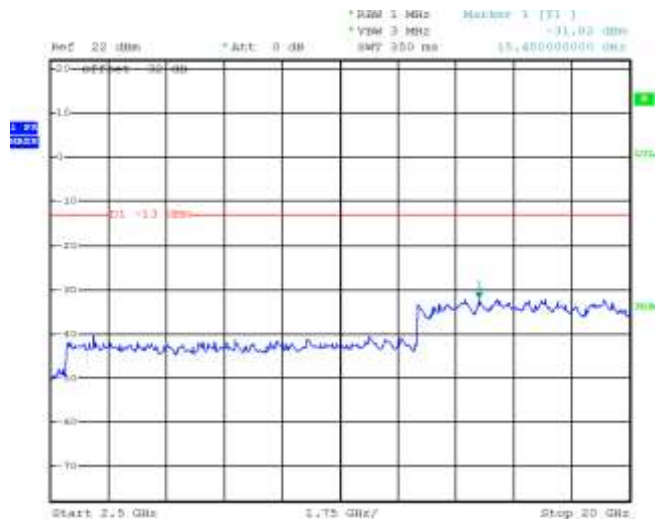
**Figure 2-10a: BAND II, Spurious Conducted Emissions, Middle Channel**



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



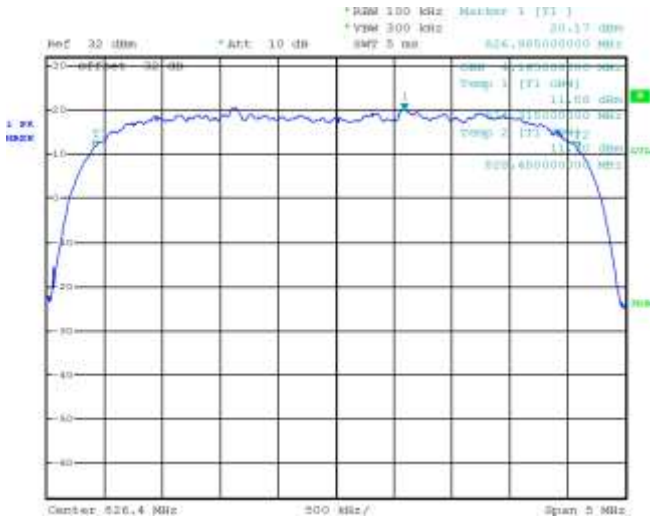
**Figure 2-12a: BAND II, Spurious Conducted Emissions, High Channel**



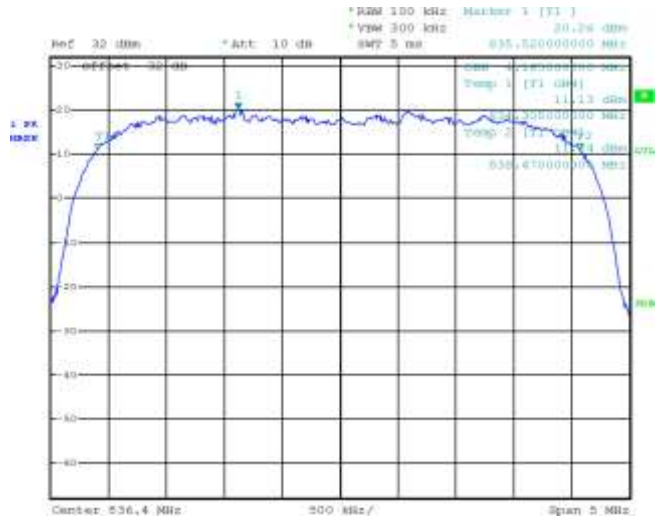
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

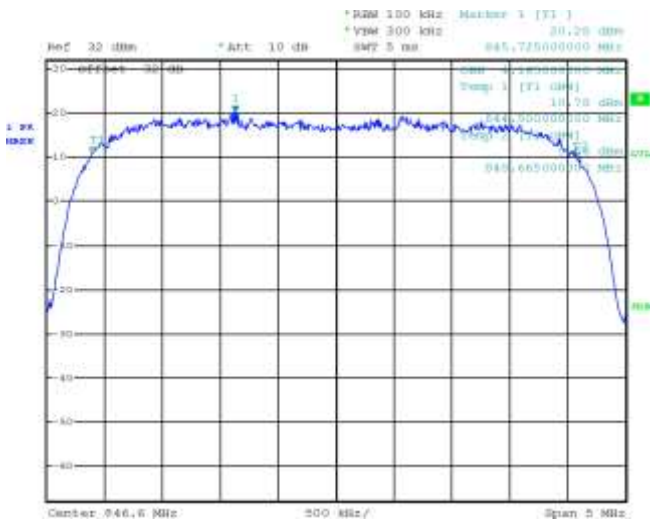
**Figure 2-13a: Occupied Bandwidth, Band V Low Channel**



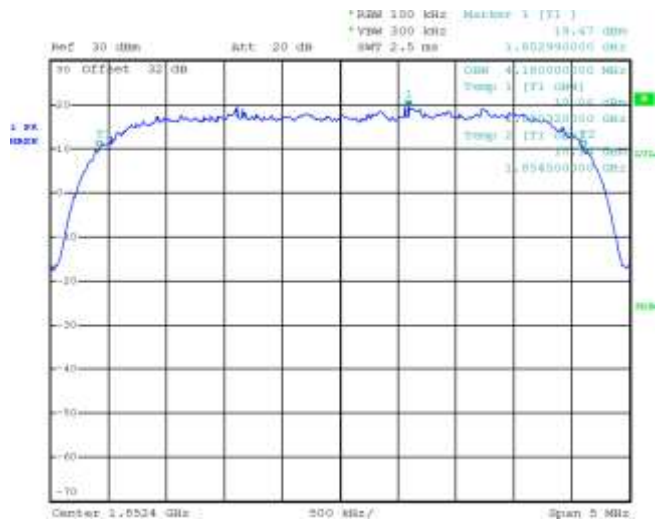
**Figure 2-14a: Occupied Bandwidth, Band V Middle Channel**



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



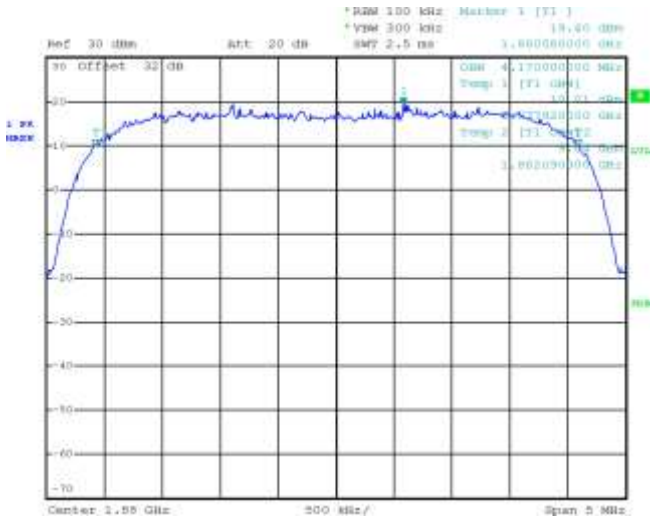
**Figure 2-16a: Occupied Bandwidth, Band II Low Channel**



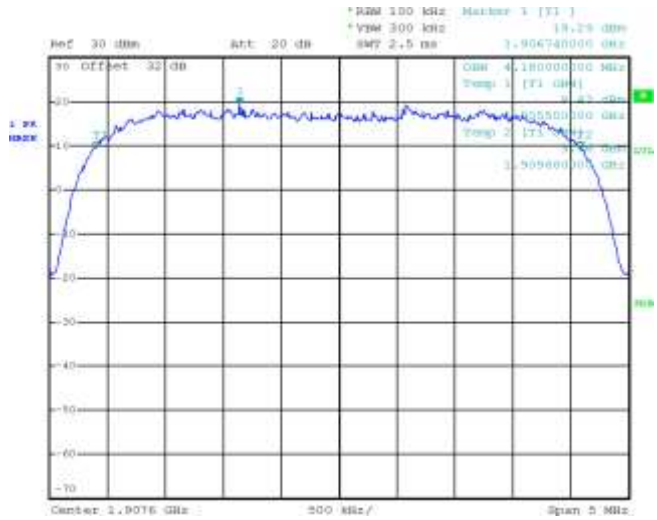
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

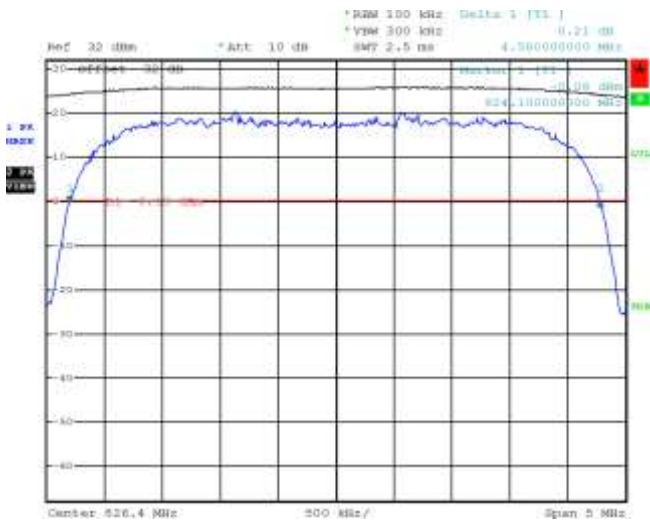
**Figure 2-17a: Occupied Bandwidth, Band II Middle Channel**



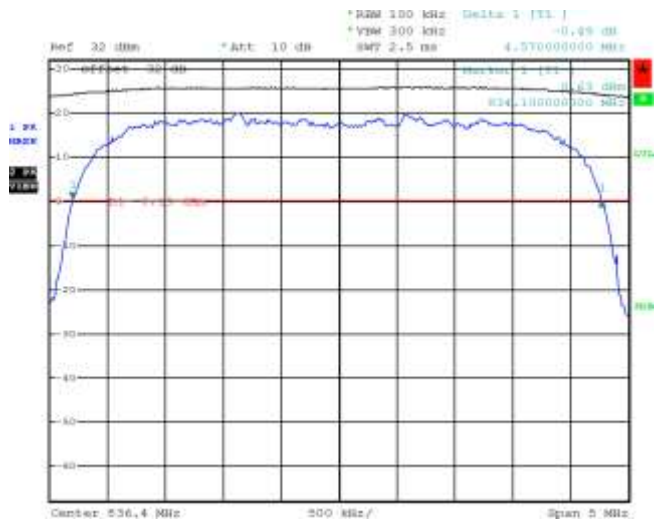
**Figure 2-18a: Occupied Bandwidth, Band II High Channel**



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



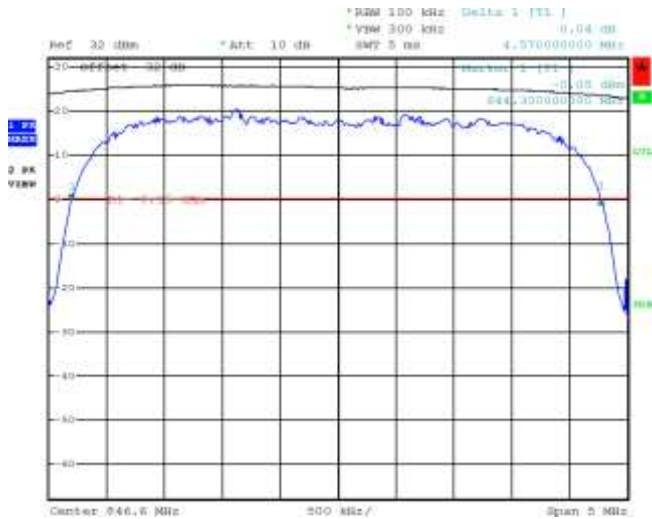
**Figure 2-20a: -26 dBc Bandwidth, Band V Middle Channel**



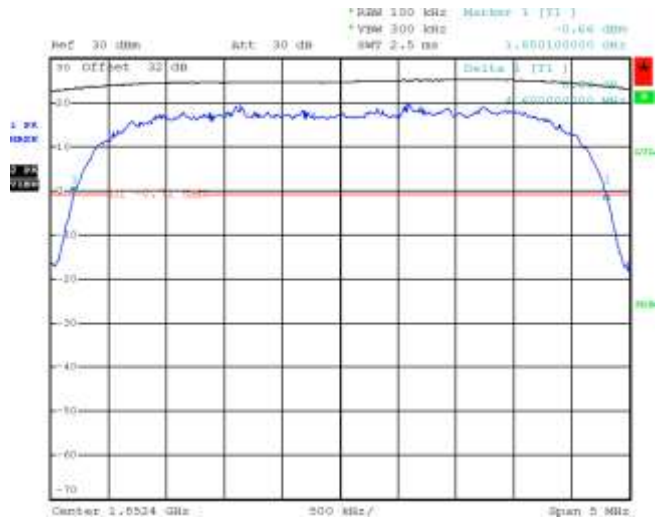
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

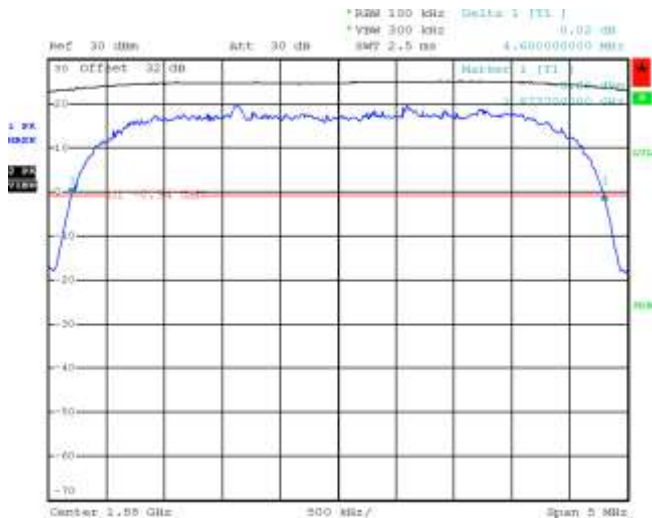
**Figure 2-21a: -26 dBc Bandwidth, Band V High Channel**



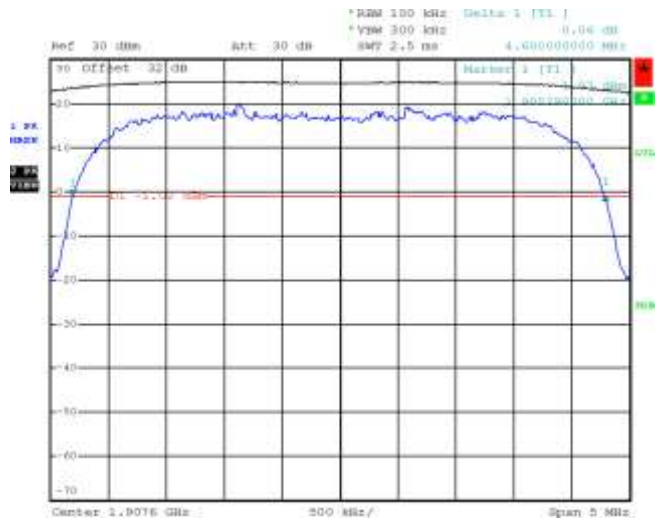
**Figure 2-22a: -26 dBc Bandwidth, Band II Low Channel**



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



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

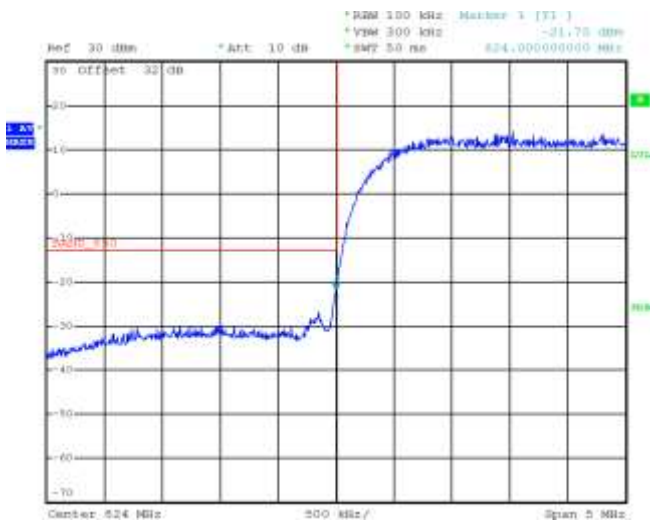




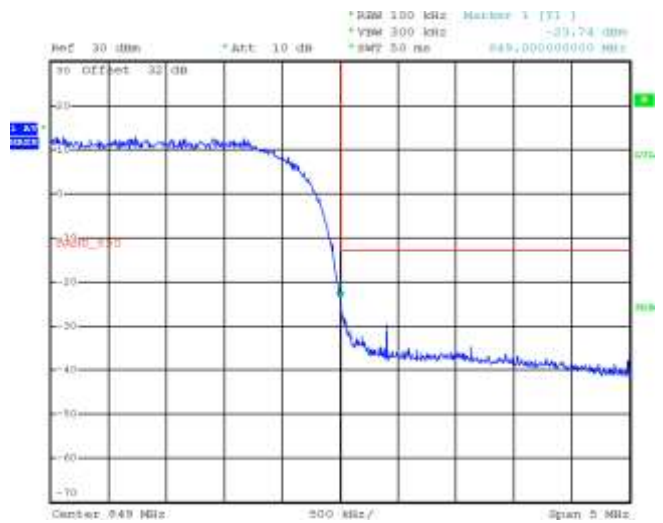
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

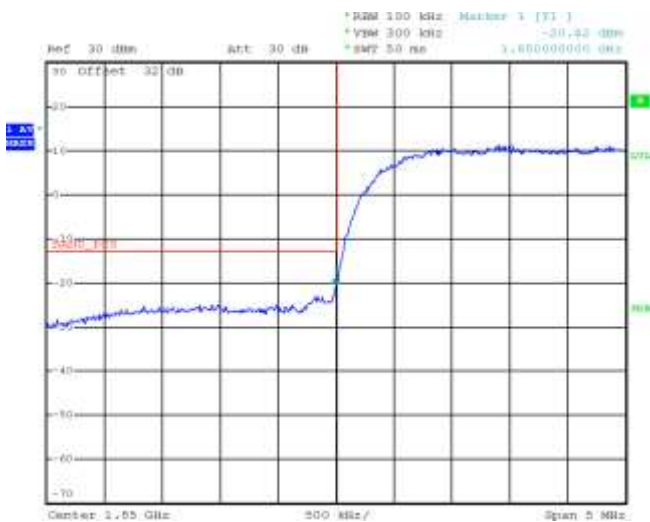
**Figure 2-25a: Band V Low Channel Mask**



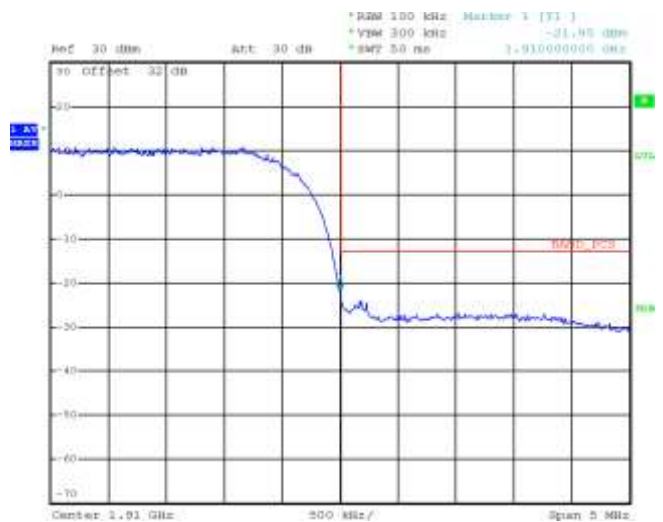
**Figure 2-26a: Band V High Channel Mask**



**Figure 2-27a: Band II Low Channel Mask**



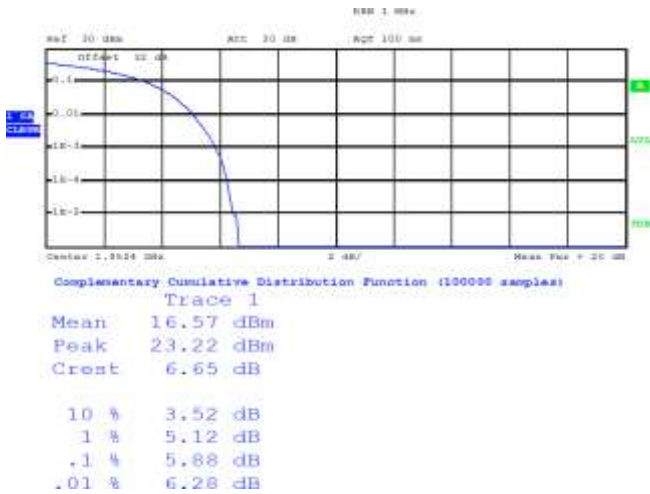
**Figure 2-28a: Band II High Channel Mask**



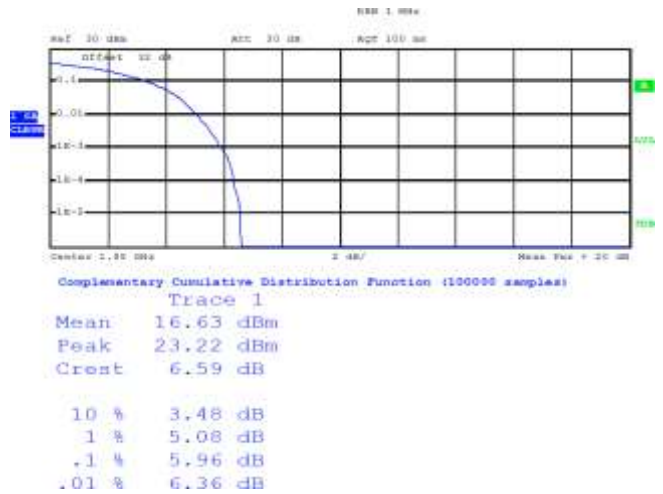
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

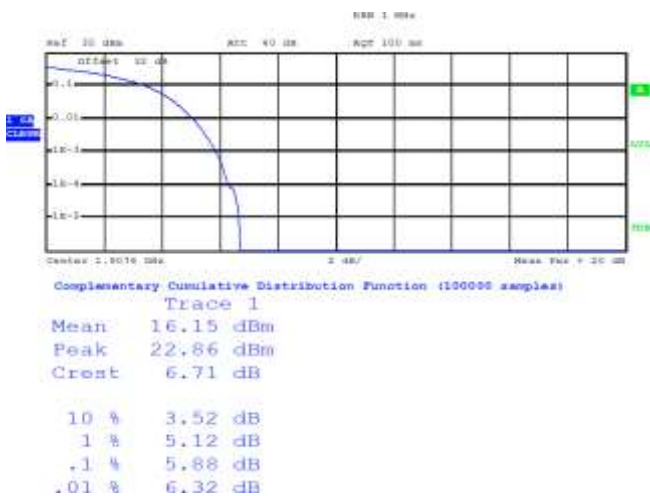
**Figure 2-29a: Band II, PAR Low Channel**



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



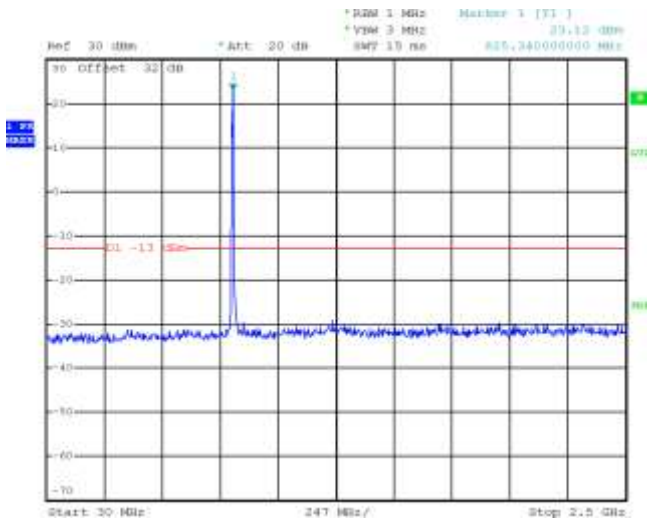
**Figure 2-31a: Band II, PAR High Channel**



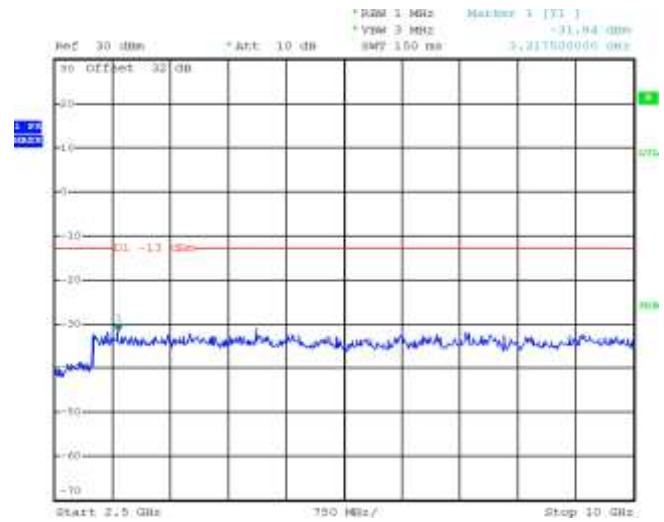
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

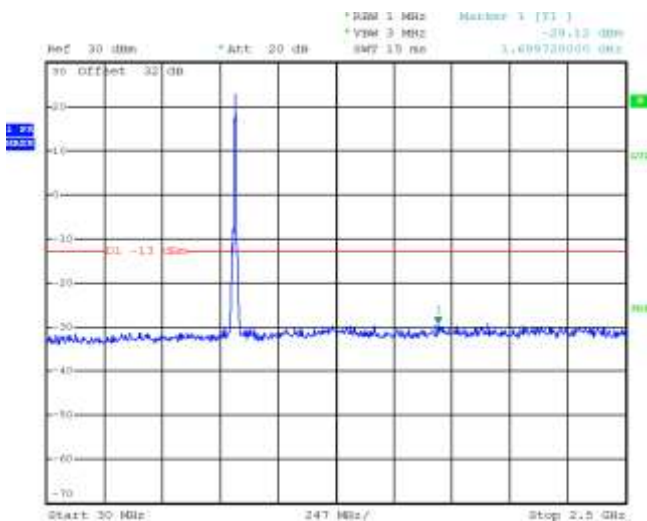
**Figure 2-32a: Band V HSUPA, Spurious Conducted Emissions, Low channel**



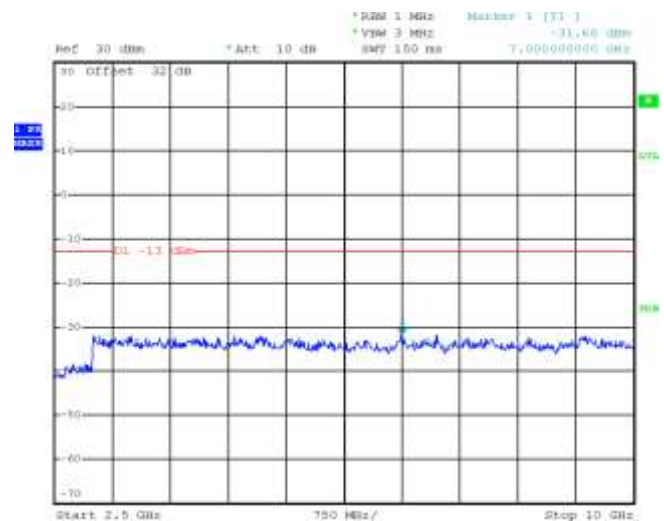
**Figure 2-33a: Band V HSUPA, Spurious Conducted Emissions, Low channel**



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



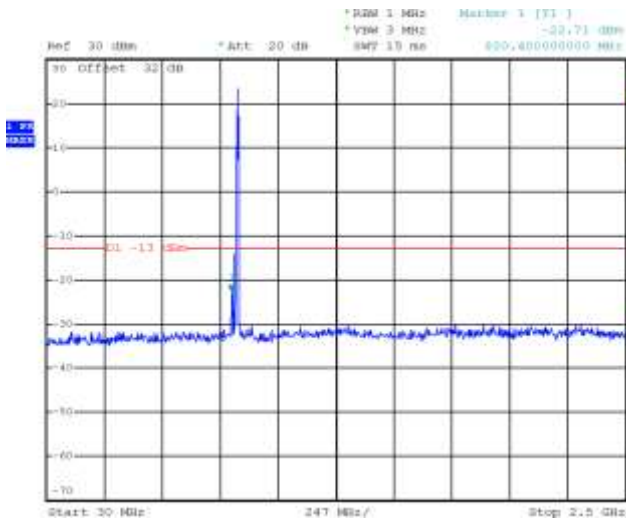
**Figure 2-35a: Band V HSUPA, Spurious Conducted Emissions, Middle channel**



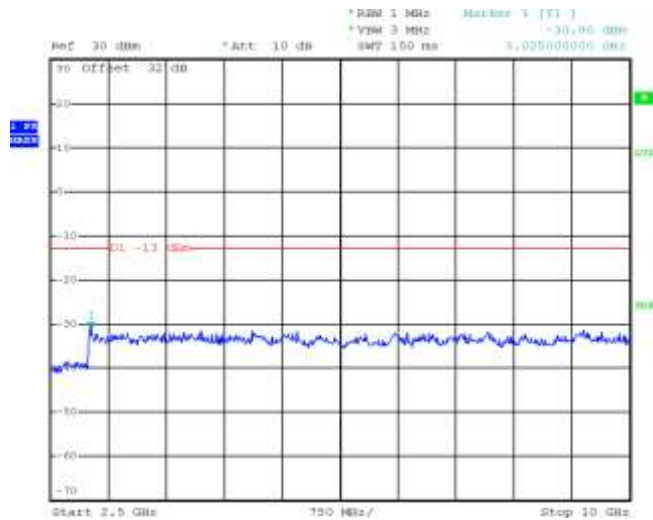
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

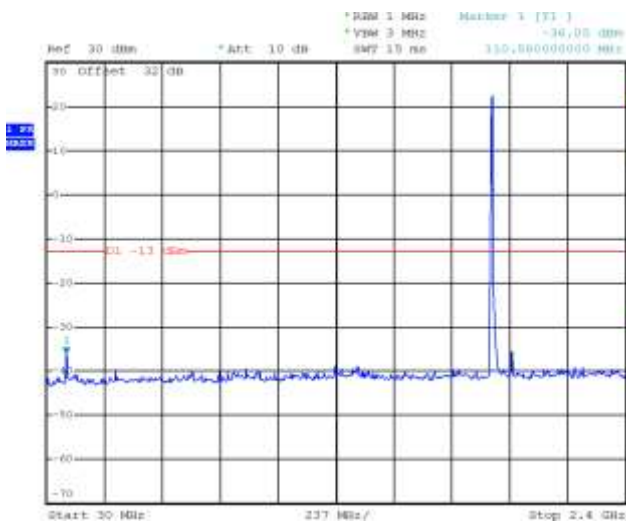
**Figure 2-36a: Band V HSUPA, Spurious Conducted Emissions, High Channel**



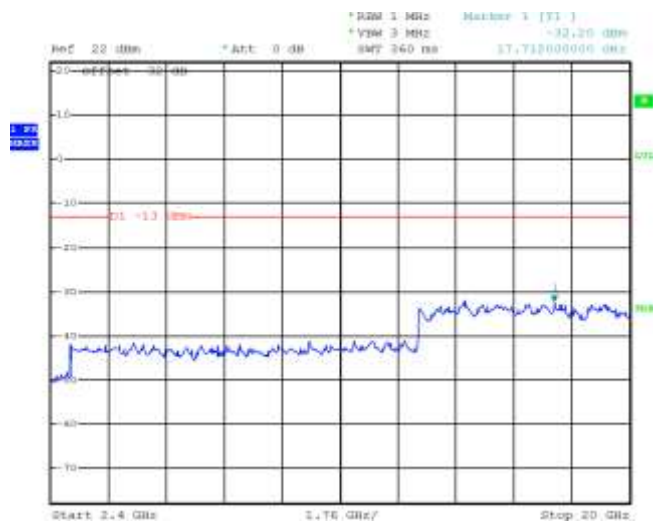
**Figure 2-37a: Band V HSUPA, Spurious Conducted Emissions, High Channel**



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



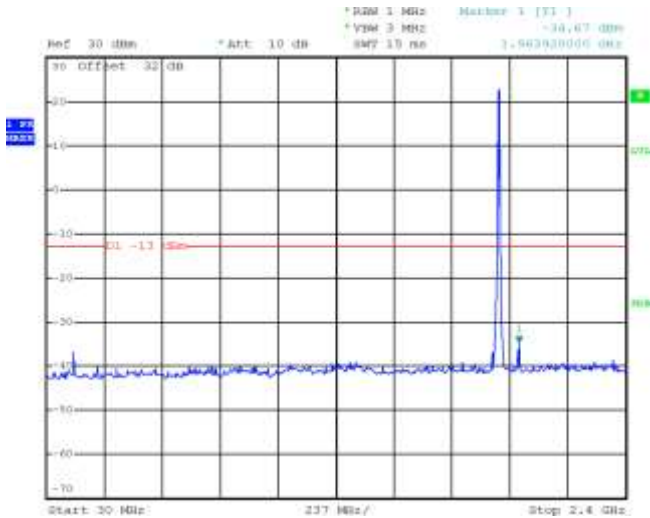
**Figure 2-39a: Band II HSUPA, Spurious Conducted Emissions, Low Channel**



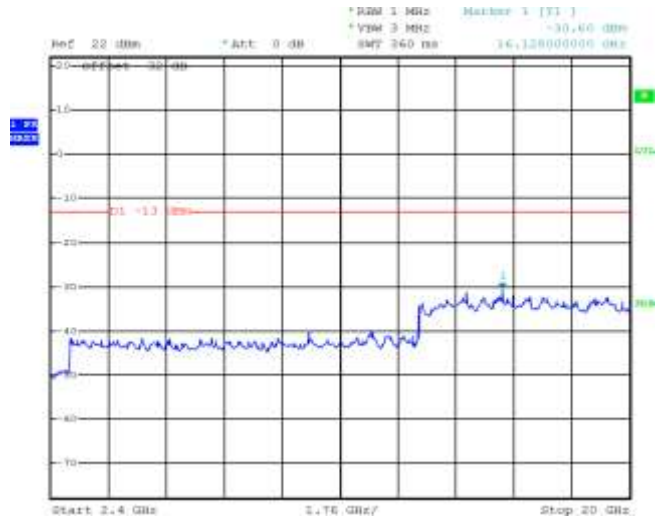
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

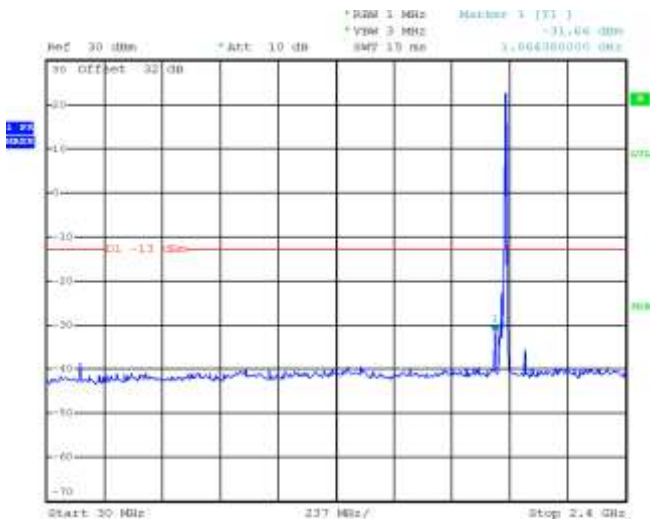
**Figure 2-40a: Band II HSUPA, Spurious Conducted Emissions, Middle Channel**



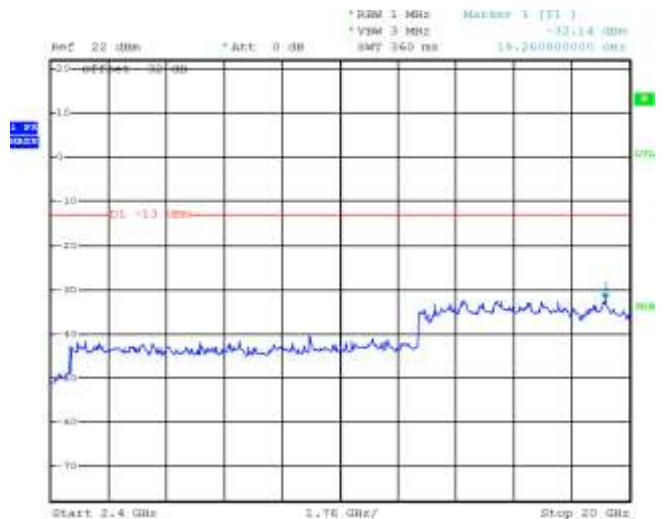
**Figure 2-41a: Band II HSUPA, Spurious Conducted Emissions, Middle Channel**



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



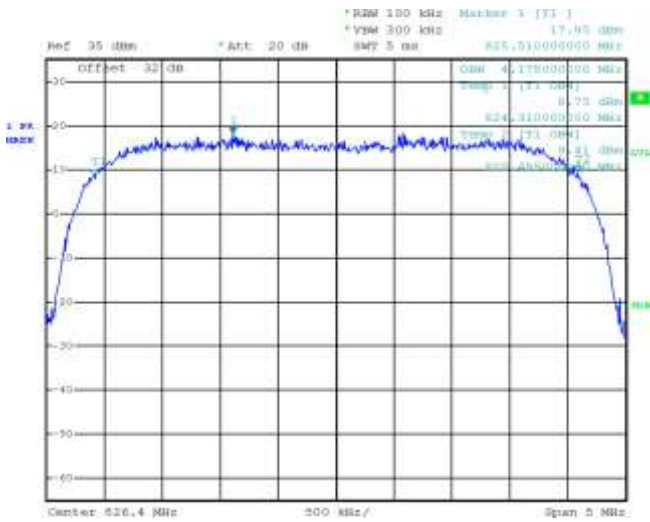
**Figure 2-43a: Band II HSUPA, Spurious Conducted Emissions, High Channel**



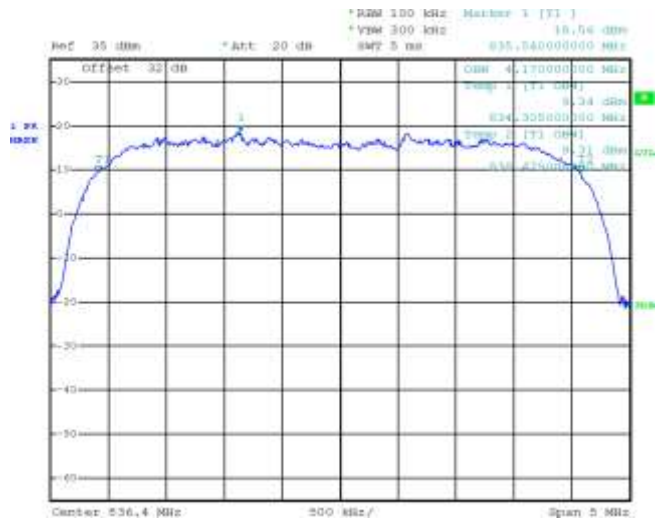
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

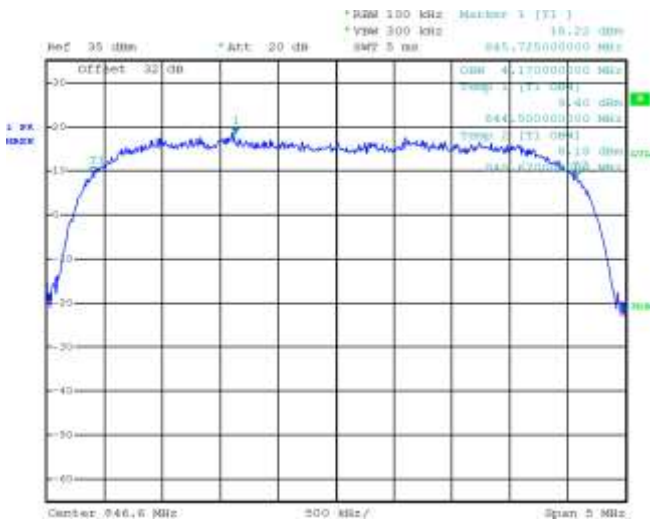
**Figure 2-44a: Occupied Bandwidth, Band V  
HSUPA Low Channel**



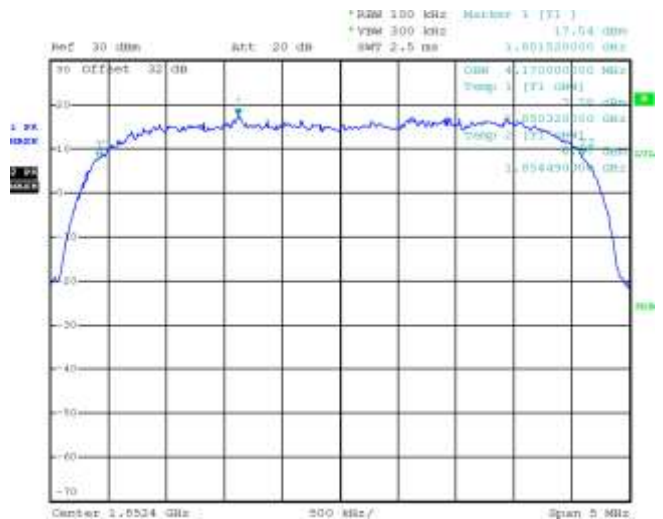
**Figure 2-45a: Occupied Bandwidth, Band V  
HSUPA Middle Channel**



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



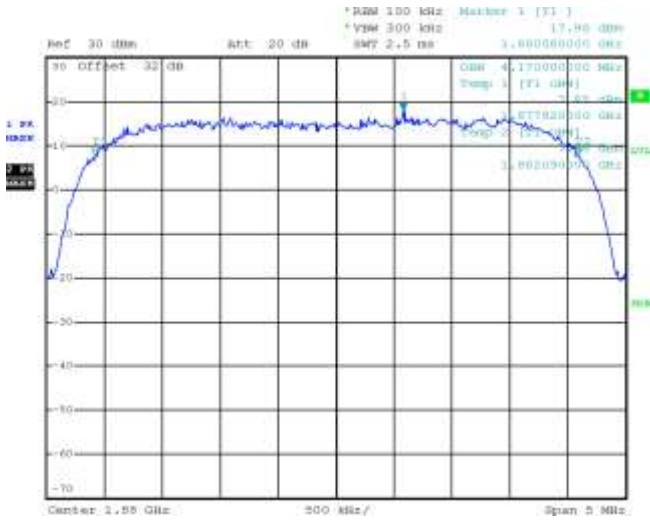
**Figure 2-47a: Occupied Bandwidth, Band II  
HSUPA Low Channel**



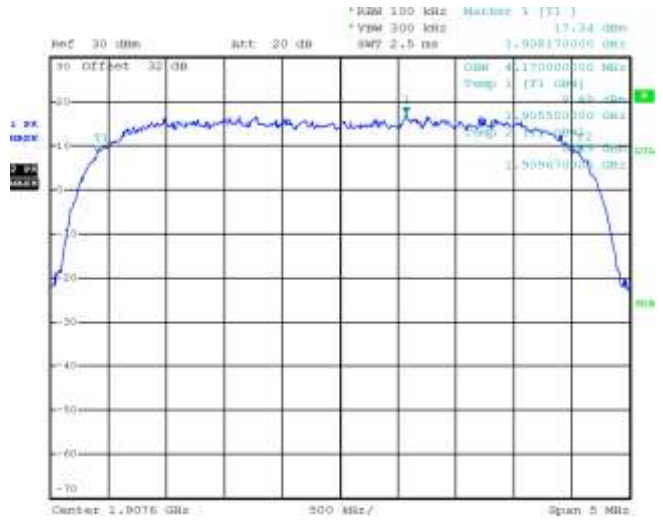
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

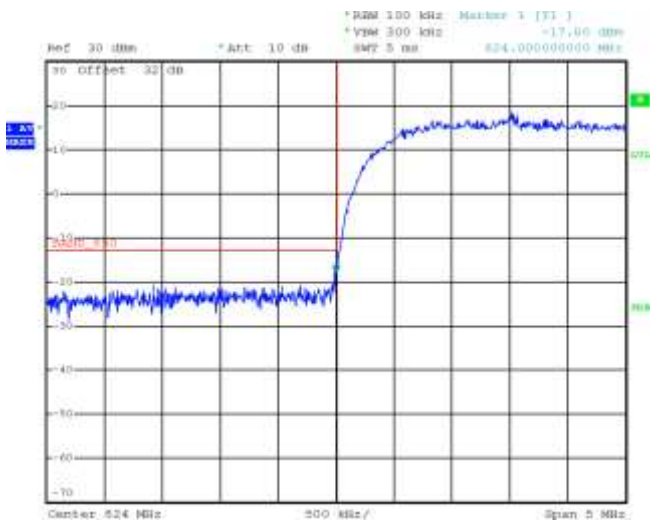
**Figure 2-48a: Occupied Bandwidth, Band II  
HSUPA Middle Channel**



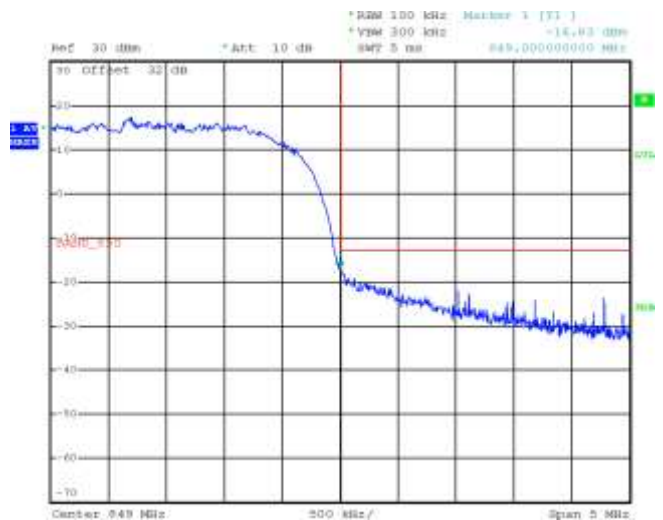
**Figure 2-49a: Occupied Bandwidth, Band II  
HSUPA High Channel**



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



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

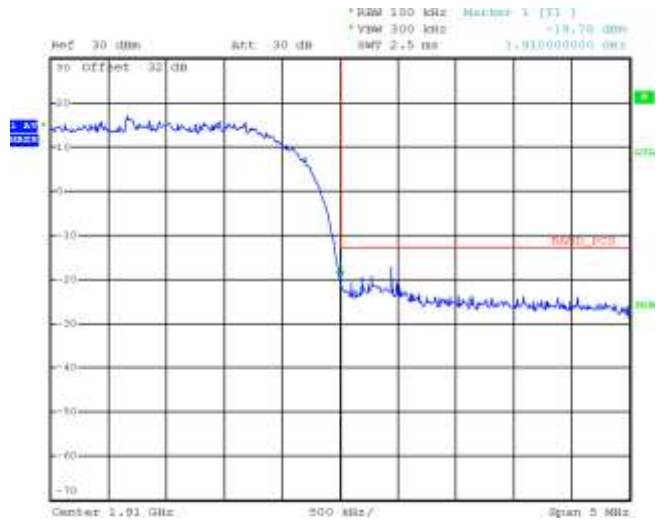
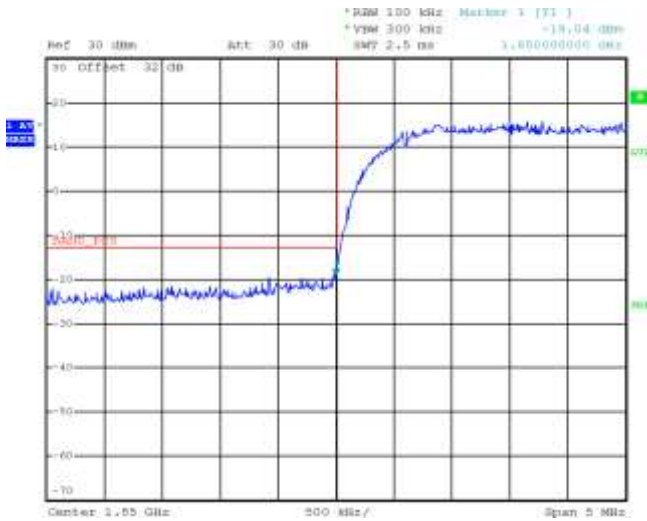


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

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

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

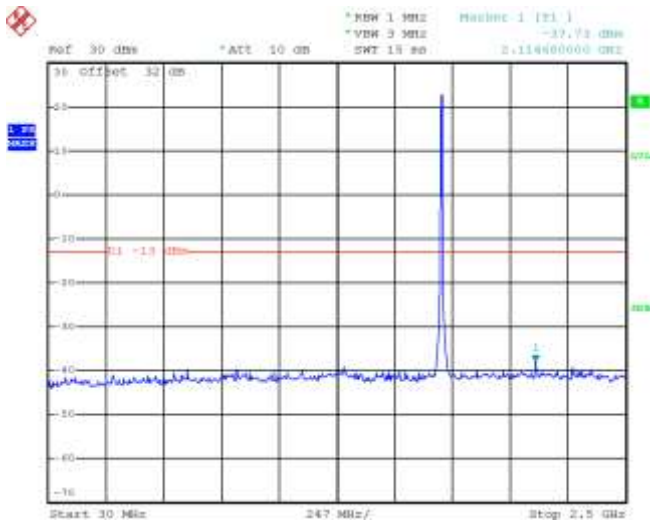




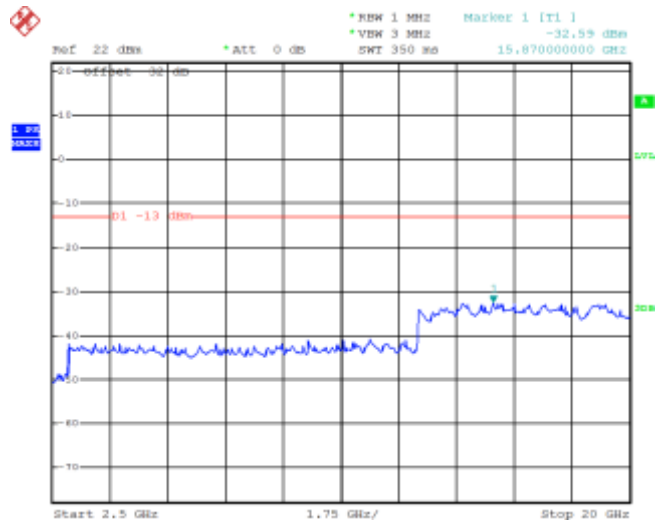
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

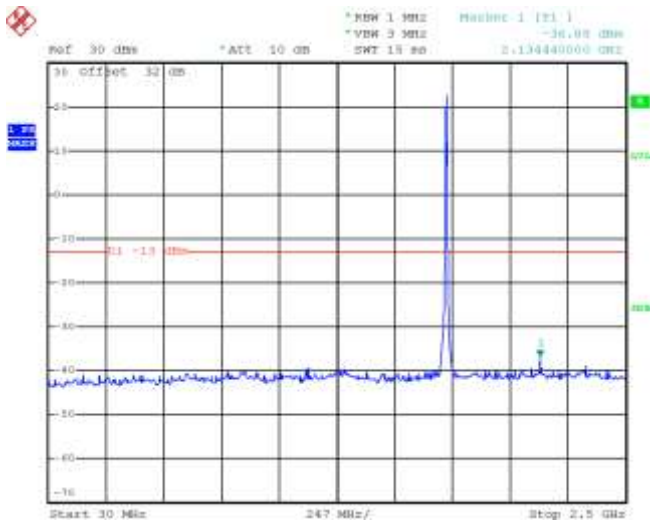
**Figure 2-1b: Band IV, Spurious Conducted Emissions, Low channel**



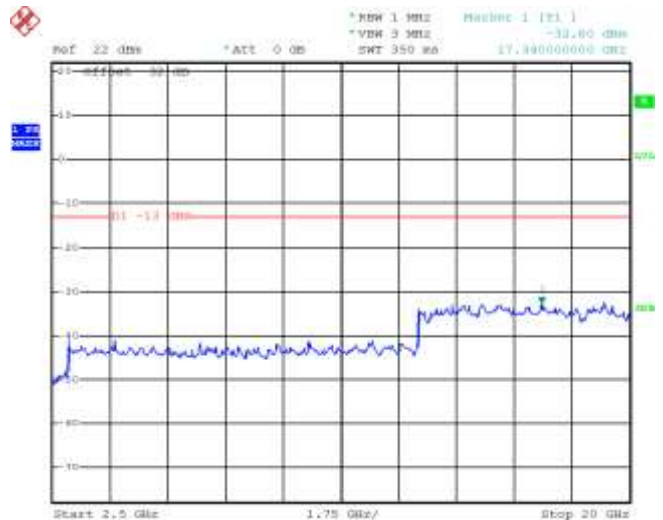
**Figure 2-2b: Band IV, Spurious Conducted Emissions, Low channel**



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



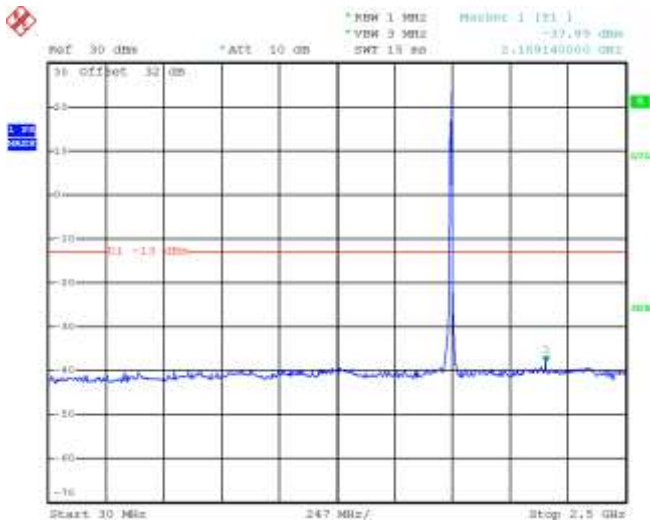
**Figure 2-4b: Band IV, Spurious Conducted Emissions, Middle channel**



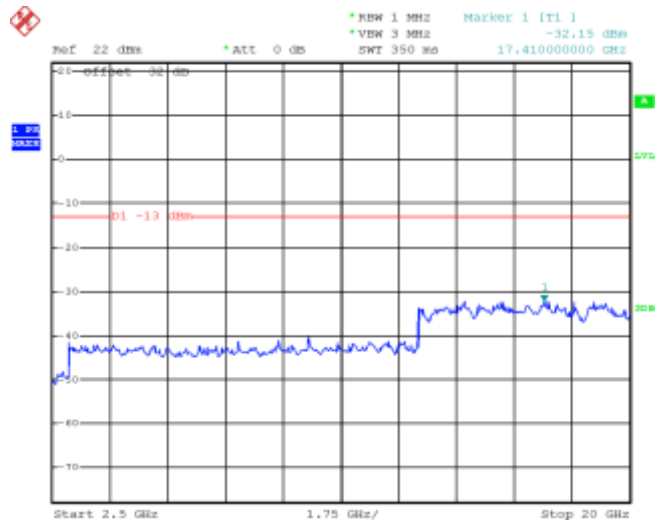
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

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



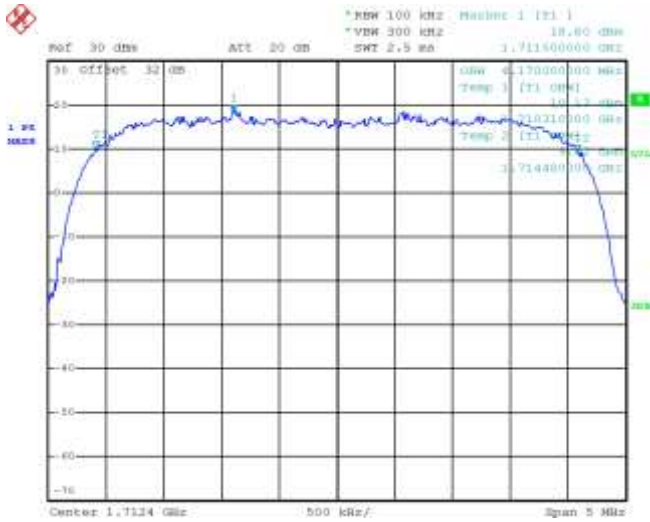
**Figure 2-6b: Band IV, Spurious Conducted Emissions, High Channel**



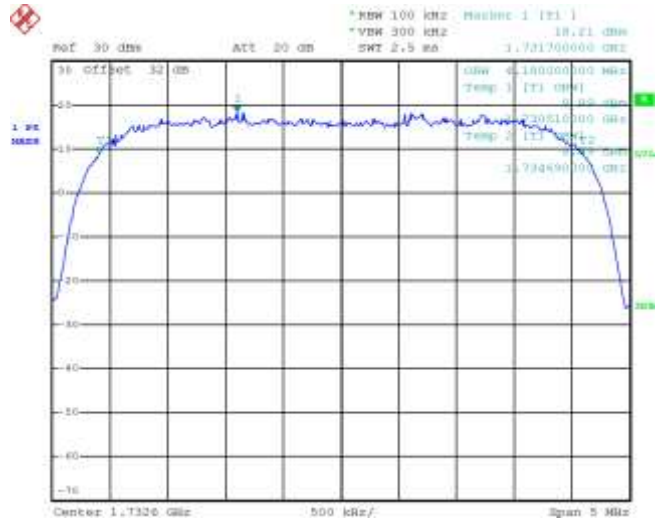
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

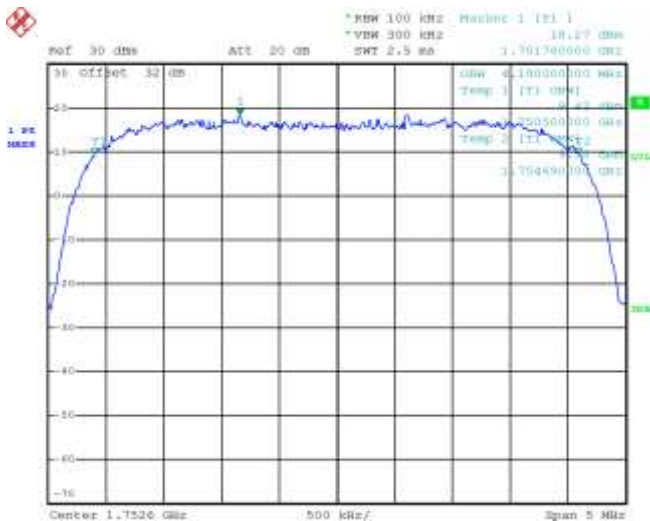
**Figure 2-7b: Occupied Bandwidth, Band IV Low Channel**



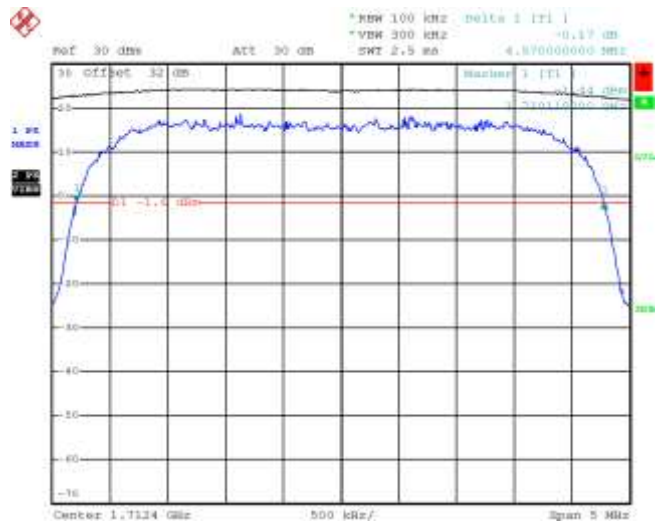
**Figure 2-8b: Occupied Bandwidth, Band IV Middle Channel**



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

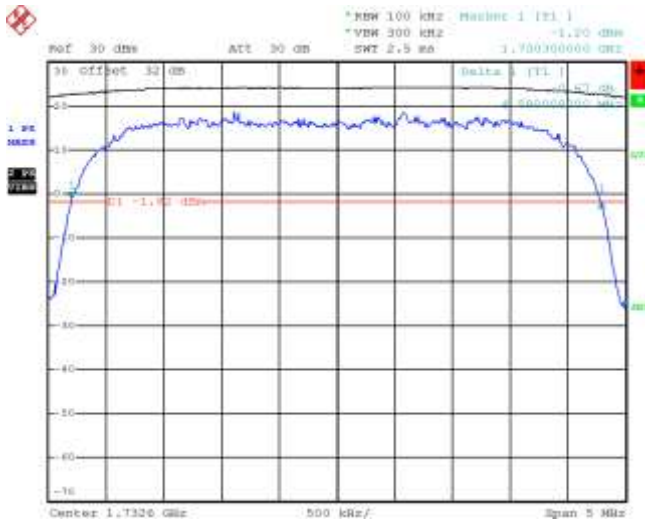


**Figure 2-10b: -26 dBc Bandwidth, Band IV Low Channel**

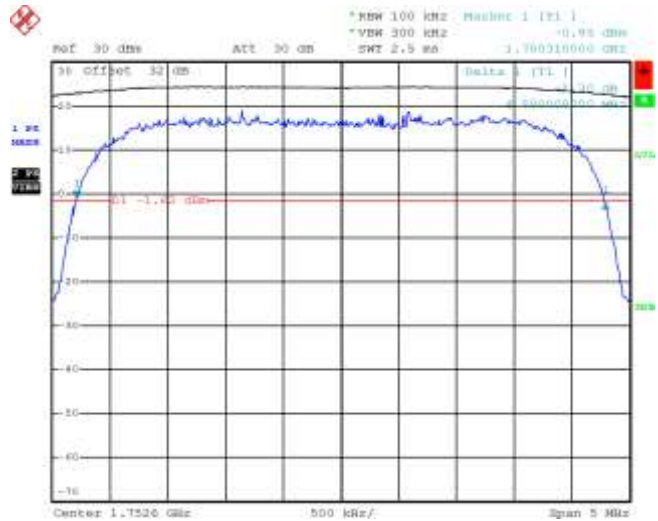


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

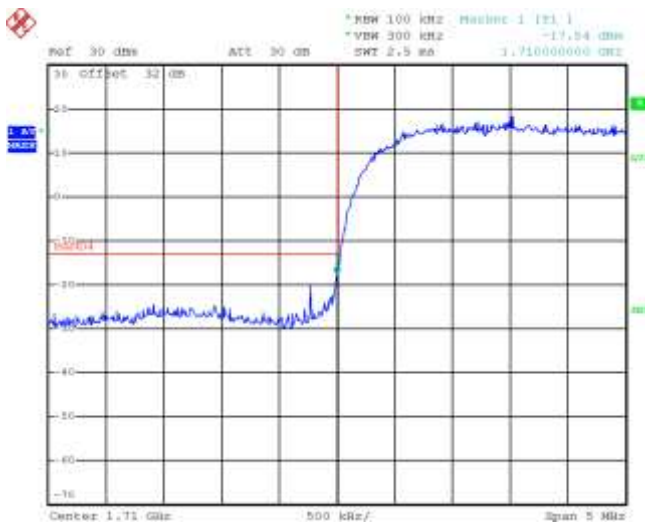
**Figure 2-11b: -26 dBc Bandwidth, Band IV Middle Channel**



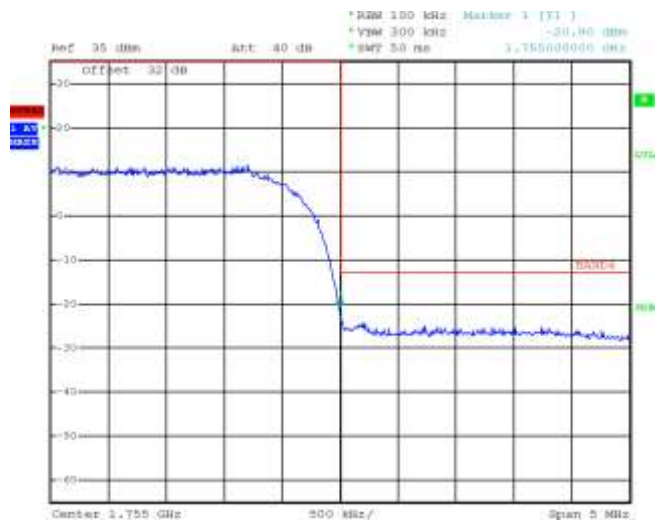
**Figure 2-12b: -26 dBc Bandwidth, Band IV High Channel**



**Figure 2-13b: Band IV Low Channel Mask**



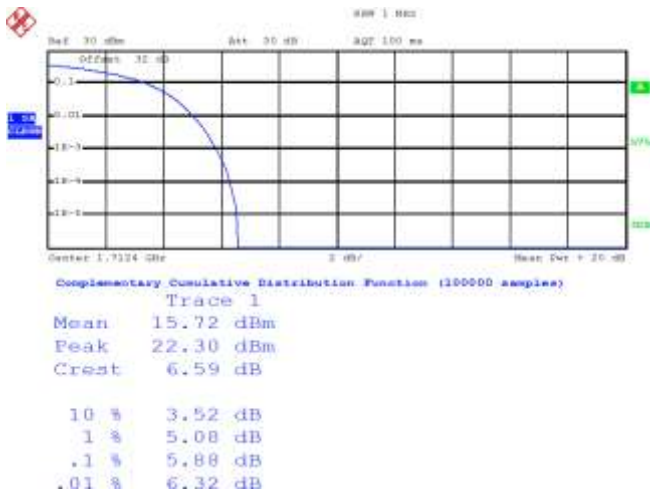
**Figure 2-14b: Band IV High Channel Mask**



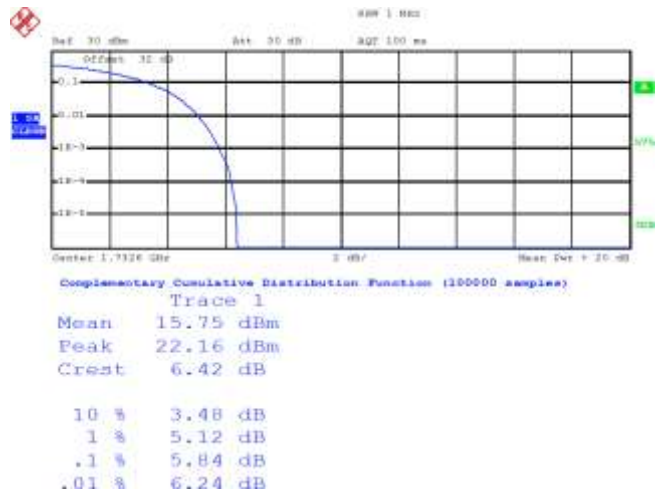
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

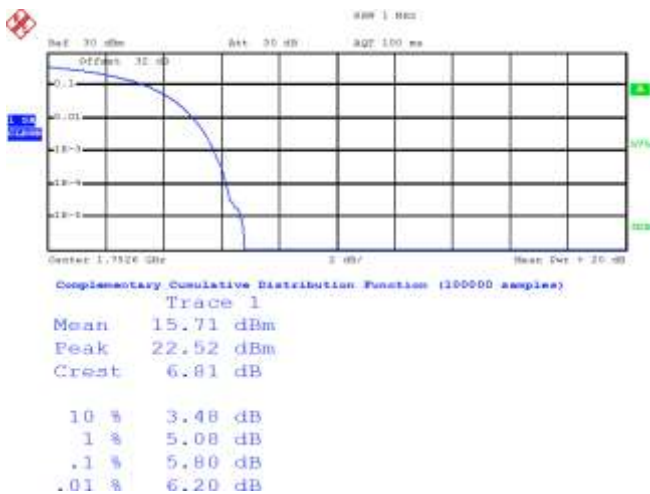
**Figure 2-15b: Band IV, PAR Low Channel**



**Figure 2-16b: Band IV, PAR Mid Channel**



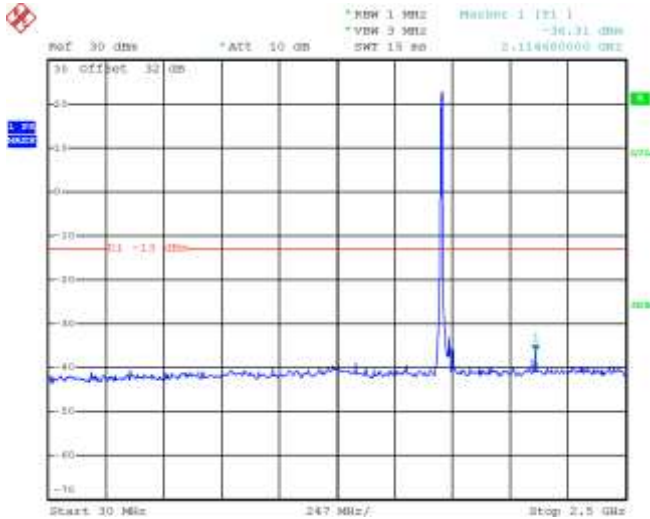
**Figure 2-17b: Band IV, PAR High Channel**



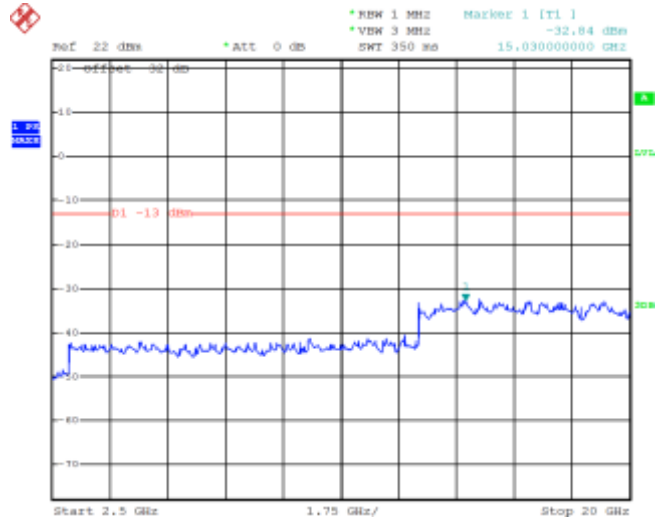
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

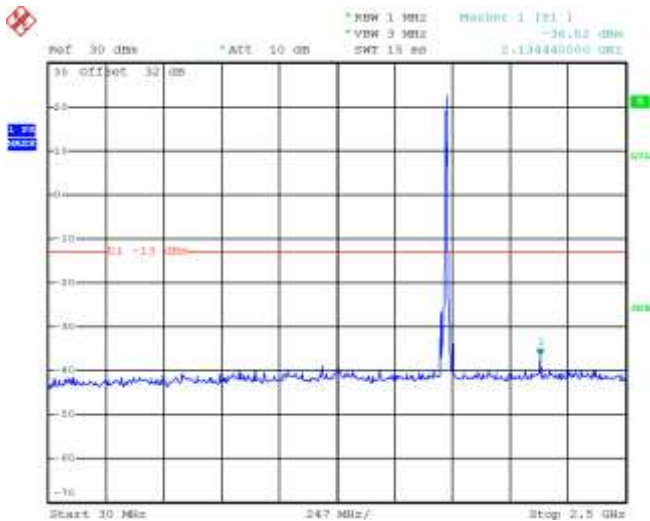
**Figure 2-18b: Band IV HSUPA, Spurious Conducted Emissions, Low channel**



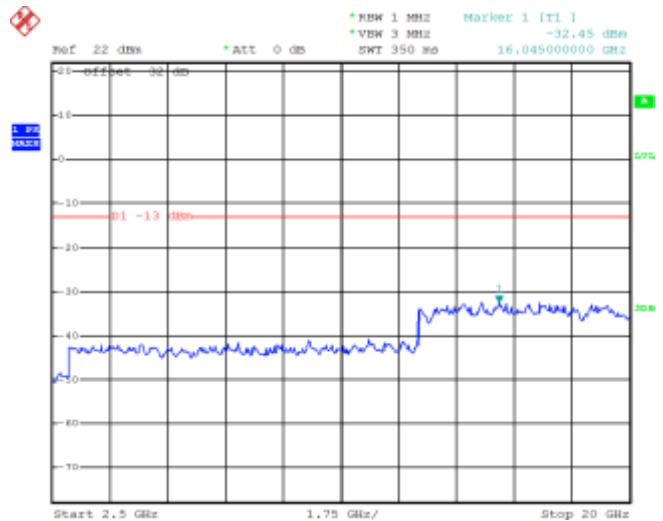
**Figure 2-19b: Band IV HSUPA, Spurious Conducted Emissions, Low channel**



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



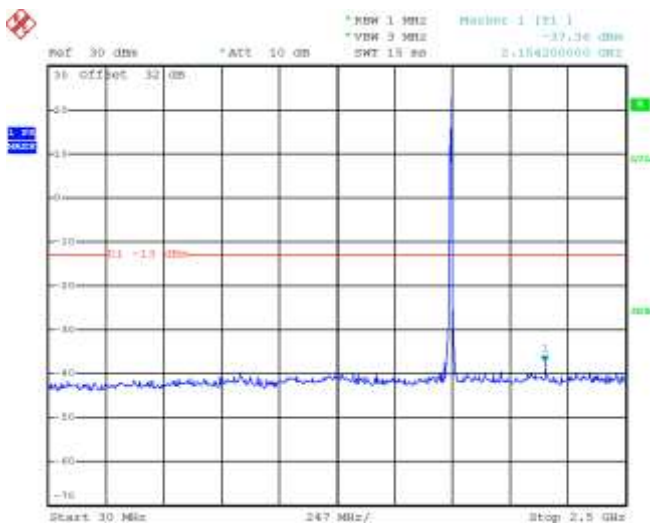
**Figure 2-21b: Band IV HSUPA, Spurious Conducted Emissions, Middle channel**



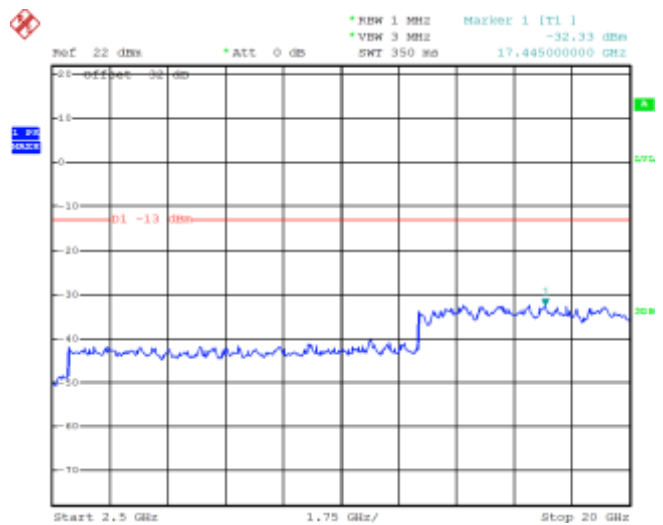
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

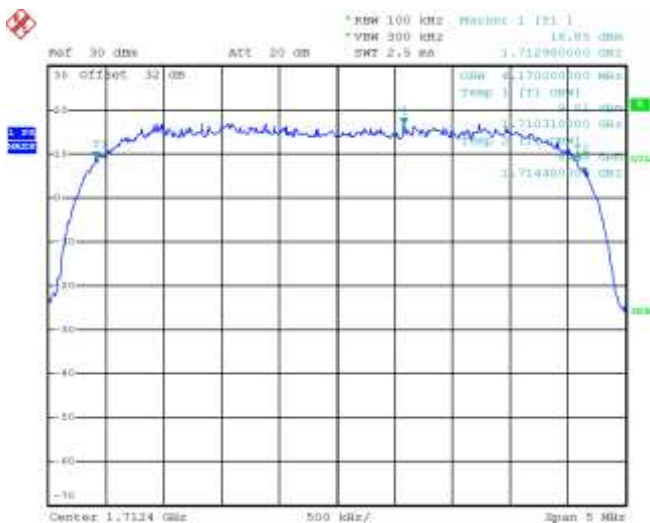
**Figure 2-22b: Band IV HSUPA, Spurious Conducted Emissions, High Channel**



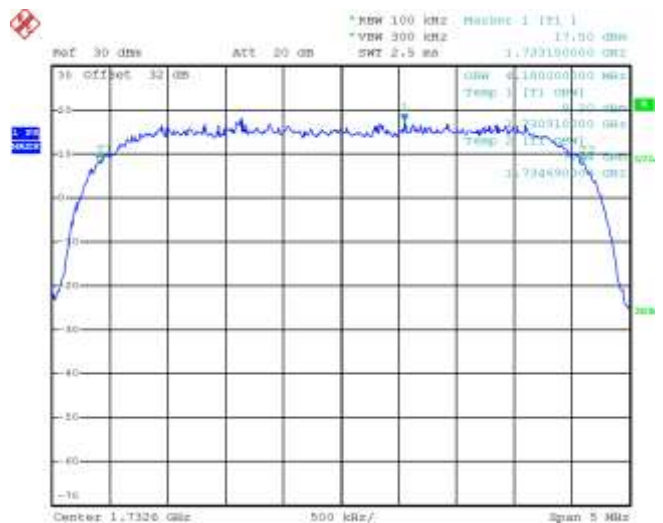
**Figure 2-23b: Band IV HSUPA, Spurious Conducted Emissions, High Channel**



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



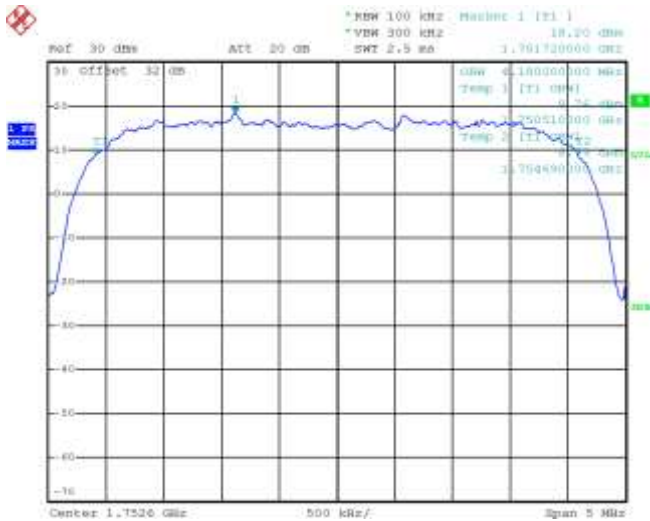
**Figure 2-25b: Occupied Bandwidth, Band IV HSUPA Middle Channel**



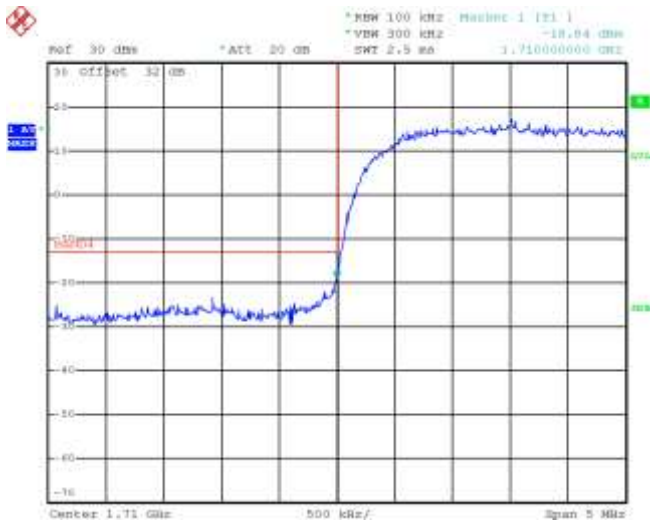
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

WCDMA Conducted RF Emission Test Data cont'd

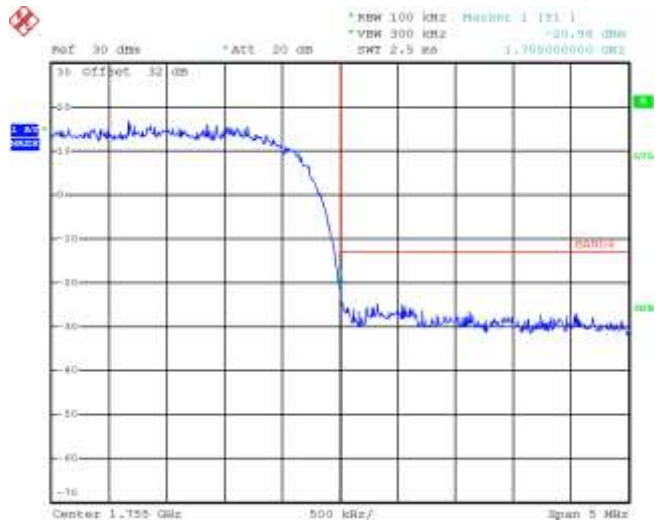
**Figure 2-26b: Occupied Bandwidth, Band IV  
HSUPA High Channel**



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



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

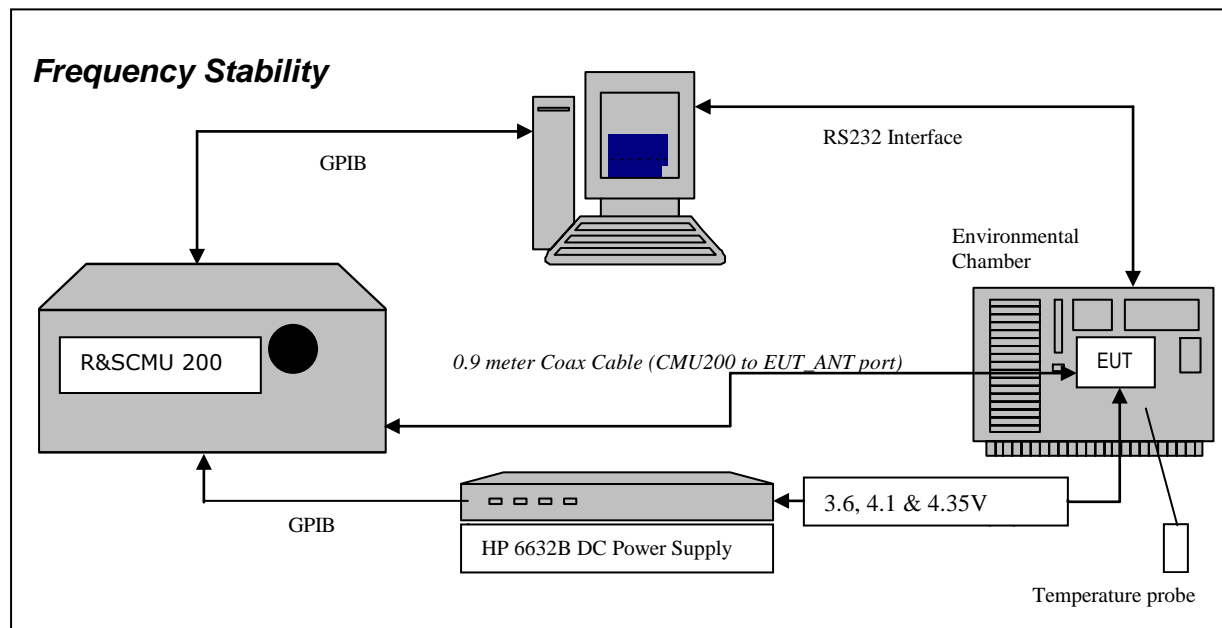




## APPENDIX 2B – WCDMA Band II/IV/V FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### WCDMA Frequency Stability Test Data



The following measurements were performed by Chuan Tran.

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 24.235, CFR 47 chapter 1, Section 22.917 RSS-132, 4.3 Frequency Stability, 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 CMU 200 and the EUT antenna port.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### Test Setup:

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

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

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

The EUT repetitively transmitted 100 bursts for each set of programmed parameters recording temperature, voltage settings, and systematically selected frequencies. The power supply was cycled from minimum voltage 3.6 volts, 4.1 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 826.4, 836.4 and 846.6 MHz for the WCDMA band V. 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

Procedure:

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

1. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
10. The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
11. Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
12. Increase temperature by 10°C and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
14. Repeat steps 5 to 10 changing the supply voltage to 4.35 volts

Procedure 5 to 10 was repeated at room temperature (20°C) with the power supply voltage set to 3.6, 4.1 and 4.35 volts

The maximum frequency error in the WCDMA Band V measured was **0.0128 PPM**.  
The maximum frequency error in the WCDMA Band II measured was **0.0159PPM**.  
The maximum frequency error in the WCDMA Band IV measured was **-0.0233 PPM**.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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

Traffic Channel Number	WCDMA Band V Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	20	7.00	0.0085
4182	836.4	3.6	20	6.26	0.0075
4233	846.6	3.6	20	-6.94	-0.0082

Traffic Channel Number	WCDMA Band V Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.1	20	6.33	0.0077
4182	836.4	4.1	20	4.59	0.0055
4233	846.6	4.1	20	-6.52	-0.0077

Traffic Channel Number	WCDMA Band V Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.35	20	6.70	0.0081
4182	836.4	4.35	20	4.91	0.0059
4233	846.6	4.35	20	-6.30	-0.0074

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band V 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	-4.04	-0.0049
4132	826.4	3.6	-20	-5.33	-0.0064
4132	826.4	3.6	-10	-5.48	-0.0066
4132	826.4	3.6	0	-5.04	-0.0061
4132	826.4	3.6	10	4.85	0.0059
4132	826.4	3.6	20	7.00	0.0085
4132	826.4	3.6	30	8.07	0.0098
4132	826.4	3.6	40	8.19	0.0099
4132	826.4	3.6	50	8.56	0.0104
4132	826.4	3.6	60	9.96	0.0121
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.1	-30	-5.36	-0.0065
4132	826.4	4.1	-20	-6.53	-0.0079
4132	826.4	4.1	-10	-5.52	-0.0067
4132	826.4	4.1	0	-4.68	-0.0057
4132	826.4	4.1	10	5.60	0.0068
4132	826.4	4.1	20	6.33	0.0077
4132	826.4	4.1	30	6.93	0.0084
4132	826.4	4.1	40	8.76	0.0106
4132	826.4	4.1	50	8.27	0.0100
4132	826.4	4.1	60	8.51	0.0103
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.35	-30	5.17	0.0063
4132	826.4	4.35	-20	-5.55	-0.0067
4132	826.4	4.35	-10	-5.98	-0.0072
4132	826.4	4.35	0	4.50	0.0054
4132	826.4	4.35	10	3.98	0.0048
4132	826.4	4.35	20	6.70	0.0081
4132	826.4	4.35	30	7.23	0.0088
4132	826.4	4.35	40	10.54	<b>0.0128</b>
4132	826.4	4.35	50	8.10	0.0098
4132	826.4	4.35	60	8.44	0.0102

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Band V 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	5.63	0.0067
4182	836.4	3.6	-20	4.36	0.0052
4182	836.4	3.6	-10	5.39	0.0064
4182	836.4	3.6	0	5.55	0.0066
4182	836.4	3.6	10	5.20	0.0062
4182	836.4	3.6	20	6.26	0.0075
4182	836.4	3.6	30	4.56	0.0055
4182	836.4	3.6	40	5.37	0.0064
4182	836.4	3.6	50	6.03	0.0072
4182	836.4	3.6	60	5.04	0.0060
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.1	-30	4.76	0.0057
4182	836.4	4.1	-20	4.94	0.0059
4182	836.4	4.1	-10	4.97	0.0059
4182	836.4	4.1	0	4.62	0.0055
4182	836.4	4.1	10	6.18	0.0074
4182	836.4	4.1	20	4.59	0.0055
4182	836.4	4.1	30	6.55	0.0078
4182	836.4	4.1	40	7.26	0.0087
4182	836.4	4.1	50	-8.16	-0.0098
4182	836.4	4.1	60	5.57	0.0067
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	4.35	-30	5.40	0.0065
4182	836.4	4.35	-20	5.02	0.0060
4182	836.4	4.35	-10	5.68	0.0068
4182	836.4	4.35	0	6.73	0.0080
4182	836.4	4.35	10	5.43	0.0065
4182	836.4	4.35	20	4.91	0.0059
4182	836.4	4.35	30	5.39	0.0064
4182	836.4	4.35	40	6.74	0.0081
4182	836.4	4.35	50	7.29	0.0087
4182	836.4	4.35	60	4.94	0.0059

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band V 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	4.46	0.0053
4233	846.6	3.6	-20	5.80	0.0068
4233	846.6	3.6	-10	4.94	0.0058
4233	846.6	3.6	0	5.83	0.0069
4233	846.6	3.6	10	-4.82	-0.0057
4233	846.6	3.6	20	-6.94	-0.0082
4233	846.6	3.6	30	-6.94	-0.0082
4233	846.6	3.6	40	-10.16	-0.0120
4233	846.6	3.6	50	-7.61	-0.0090
4233	846.6	3.6	60	-8.65	-0.0102
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.1	-30	5.22	0.0062
4233	846.6	4.1	-20	6.74	0.0080
4233	846.6	4.1	-10	6.64	0.0078
4233	846.6	4.1	0	6.79	0.0080
4233	846.6	4.1	10	-6.07	-0.0072
4233	846.6	4.1	20	-6.52	-0.0077
4233	846.6	4.1	30	-7.35	-0.0087
4233	846.6	4.1	40	-9.48	-0.0112
4233	846.6	4.1	50	-8.67	-0.0102
4233	846.6	4.1	60	-8.96	-0.0106
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	4.35	-30	-7.97	-0.0094
4233	846.6	4.35	-20	5.94	0.0070
4233	846.6	4.35	-10	6.03	0.0071
4233	846.6	4.35	0	-4.33	-0.0051
4233	846.6	4.35	10	-5.43	-0.0064
4233	846.6	4.35	20	-6.30	-0.0074
4233	846.6	4.35	30	-7.46	-0.0088
4233	846.6	4.35	40	-8.10	-0.0096
4233	846.6	4.35	50	-8.39	-0.0099
4233	846.6	4.35	60	-8.51	-0.0101



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following measurements were performed on product RGF111LW.

Date of Test: August 26, 2013

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

**WCDMA Band II 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	-13.35	-0.0072
9400	1880.00	3.6	20	10.09	0.0054
9538	1907.60	3.6	20	13.17	0.0069

Traffic Channel Number	WCDMA1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.1	20	-10.38	-0.0056
9400	1880.00	4.1	20	11.31	0.0060
9538	1907.60	4.1	20	8.77	0.0046

Traffic Channel Number	WCDMA1900 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	20	-11.66	-0.0063
9400	1880.00	4.35	20	10.12	0.0054
9538	1907.60	4.35	20	22.20	0.0116

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band II 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	-7.92	-0.0043
9262	1852.40	3.6	-20	-14.92	-0.0081
9262	1852.40	3.6	-10	-14.21	-0.0077
9262	1852.40	3.6	0	-14.72	-0.0079
9262	1852.40	3.6	10	-13.18	-0.0071
9262	1852.40	3.6	20	-13.35	-0.0072
9262	1852.40	3.6	30	-11.29	-0.0061
9262	1852.40	3.6	40	9.32	0.0050
9262	1852.40	3.6	50	11.83	0.0064
9262	1852.40	3.6	60	<b>29.43</b>	<b>0.0159</b>
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.1	-30	-7.10	-0.0038
9262	1852.40	4.1	-20	-10.77	-0.0058
9262	1852.40	4.1	-10	-12.40	-0.0067
9262	1852.40	4.1	0	-14.60	-0.0079
9262	1852.40	4.1	10	-11.37	-0.0061
9262	1852.40	4.1	20	-10.38	-0.0056
9262	1852.40	4.1	30	18.59	0.0100
9262	1852.40	4.1	40	8.00	0.0043
9262	1852.40	4.1	50	8.51	0.0046
9262	1852.40	4.1	60	6.90	0.0037
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	-30	10.80	0.0058
9262	1852.40	4.35	-20	-11.29	-0.0061
9262	1852.40	4.35	-10	-33.91	-0.0183
9262	1852.40	4.35	0	-13.87	-0.0075
9262	1852.40	4.35	10	-13.93	-0.0075
9262	1852.40	4.35	20	-11.66	-0.0063
9262	1852.40	4.35	30	-8.59	-0.0046
9262	1852.40	4.35	40	10.28	0.0056
9262	1852.40	4.35	50	8.10	0.0044
9262	1852.40	4.35	60	8.26	0.0045

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band II 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	26.09	0.0139
9400	1880.00	3.6	-20	9.64	0.0051
9400	1880.00	3.6	-10	19.79	0.0105
9400	1880.00	3.6	0	12.37	0.0066
9400	1880.00	3.6	10	14.71	0.0078
9400	1880.00	3.6	20	10.09	0.0054
9400	1880.00	3.6	30	10.60	0.0056
9400	1880.00	3.6	40	8.47	0.0045
9400	1880.00	3.6	50	9.57	0.0051
9400	1880.00	3.6	60	9.48	0.0050
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	4.1	-30	9.41	0.0050
9400	1880.00	4.1	-20	12.53	0.0067
9400	1880.00	4.1	-10	10.16	0.0054
9400	1880.00	4.1	0	12.56	0.0067
9400	1880.00	4.1	10	11.32	0.0060
9400	1880.00	4.1	20	11.31	0.0060
9400	1880.00	4.1	30	14.14	0.0075
9400	1880.00	4.1	40	12.94	0.0069
9400	1880.00	4.1	50	-20.94	-0.0111
9400	1880.00	4.1	60	8.21	0.0044
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	4.35	-30	15.72	0.0084
9400	1880.00	4.35	-20	9.57	0.0051
9400	1880.00	4.35	-10	12.48	0.0066
9400	1880.00	4.35	0	8.80	0.0047
9400	1880.00	4.35	10	15.18	0.0081
9400	1880.00	4.35	20	10.12	0.0054
9400	1880.00	4.35	30	8.32	0.0044
9400	1880.00	4.35	40	17.76	0.0094
9400	1880.00	4.35	50	9.40	0.0050
9400	1880.00	4.35	60	-10.50	-0.0056

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band II 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	-8.12	-0.0043
9538	1907.60	3.6	-20	12.47	0.0065
9538	1907.60	3.6	-10	14.66	0.0077
9538	1907.60	3.6	0	14.34	0.0075
9538	1907.60	3.6	10	14.40	0.0076
9538	1907.60	3.6	20	13.17	0.0069
9538	1907.60	3.6	30	-17.29	-0.0091
9538	1907.60	3.6	40	-8.83	-0.0046
9538	1907.60	3.6	50	-10.74	-0.0056
9538	1907.60	3.6	60	-7.06	-0.0037
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	4.1	-30	-8.61	-0.0045
9538	1907.60	4.1	-20	14.50	0.0076
9538	1907.60	4.1	-10	14.33	0.0075
9538	1907.60	4.1	0	14.80	0.0078
9538	1907.60	4.1	10	-13.67	-0.0072
9538	1907.60	4.1	20	8.77	0.0046
9538	1907.60	4.1	30	14.28	0.0075
9538	1907.60	4.1	40	-8.44	-0.0044
9538	1907.60	4.1	50	-11.99	-0.0063
9538	1907.60	4.1	60	-8.53	-0.0045
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	21BPPM
9538	1907.60	4.35	-30	12.68	0.0066
9538	1907.60	4.35	-20	15.88	0.0083
9538	1907.60	4.35	-10	14.76	0.0077
9538	1907.60	4.35	0	14.76	0.0077
9538	1907.60	4.35	10	23.50	0.0123
9538	1907.60	4.35	20	22.20	0.0116
9538	1907.60	4.35	30	9.26	0.0049
9538	1907.60	4.35	40	-12.01	-0.0063
9538	1907.60	4.35	50	26.70	0.0140
9538	1907.60	4.35	60	-21.15	-0.0111

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following measurements were performed on product RGF111LW.

Date of Test: September 9, 2013

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

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

Traffic Channel Number	WCDMA Band IV Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	3.6	20	-18.26	-0.0107
1413	1732.6	3.6	20	9.26	0.0053
1513	1752.6	3.6	20	20.54	0.0136

Traffic Channel Number	WCDMA Band IV Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	4.1	20	-23.82	-0.0139
1413	1732.6	4.1	20	16.82	0.0097
1513	1752.6	4.1	20	20.69	0.0137

Traffic Channel Number	WCDMA Band IV Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312	1712.4	4.35	20	-19.17	-0.0112
1413	1732.6	4.35	20	7.40	0.0043
1513	1752.6	4.35	20	20.60	0.0136

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band IV 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	-19.87	-0.0116
1312.00	1712.40	3.6	-20	<b>-39.84</b>	<b>-0.0233</b>
1312.00	1712.40	3.6	-10	-31.22	-0.0182
1312.00	1712.40	3.6	0	-29.27	-0.0171
1312.00	1712.40	3.6	10	-25.33	-0.0148
1312.00	1712.40	3.6	20	-18.26	-0.0107
1312.00	1712.40	3.6	30	-11.51	-0.0067
1312.00	1712.40	3.6	40	11.09	0.0065
1312.00	1712.40	3.6	50	15.30	0.0089
1312.00	1712.40	3.6	60	13.47	0.0079
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312.00	1712.40	4.1	-30	-17.21	-0.0101
1312.00	1712.40	4.1	-20	-27.60	-0.0161
1312.00	1712.40	4.1	-10	-30.85	-0.0180
1312.00	1712.40	4.1	0	-28.21	-0.0165
1312.00	1712.40	4.1	10	-25.50	-0.0149
1312.00	1712.40	4.1	20	-23.82	-0.0139
1312.00	1712.40	4.1	30	-9.57	-0.0056
1312.00	1712.40	4.1	40	10.67	0.0062
1312.00	1712.40	4.1	50	20.68	0.0121
1312.00	1712.40	4.1	60	14.04	0.0082
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1312.00	1712.40	4.35	-30	-17.12	-0.0100
1312.00	1712.40	4.35	-20	-27.65	-0.0161
1312.00	1712.40	4.35	-10	-31.63	-0.0185
1312.00	1712.40	4.35	0	-27.66	-0.0162
1312.00	1712.40	4.35	10	-33.74	-0.0197
1312.00	1712.40	4.35	20	-19.17	-0.0112
1312.00	1712.40	4.35	30	-9.17	-0.0054
1312.00	1712.40	4.35	40	-11.08	-0.0065
1312.00	1712.40	4.35	50	19.10	0.0112
1312.00	1712.40	4.35	60	11.75	0.0069

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

WCDMA Band IV 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	8.13	0.0047
1413.00	1732.60	3.6	-20	6.74	0.0039
1413.00	1732.60	3.6	-10	7.84	0.0045
1413.00	1732.60	3.6	0	-11.34	-0.0065
1413.00	1732.60	3.6	10	15.53	0.0090
1413.00	1732.60	3.6	20	9.26	0.0053
1413.00	1732.60	3.6	30	8.56	0.0049
1413.00	1732.60	3.6	40	12.48	0.0072
1413.00	1732.60	3.6	50	10.03	0.0058
1413.00	1732.60	3.6	60	6.91	0.0040
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1413.00	1732.60	4.1	-30	-12.95	-0.0075
1413.00	1732.60	4.1	-20	8.01	0.0046
1413.00	1732.60	4.1	-10	7.40	0.0043
1413.00	1732.60	4.1	0	7.51	0.0043
1413.00	1732.60	4.1	10	9.29	0.0054
1413.00	1732.60	4.1	20	16.82	0.0097
1413.00	1732.60	4.1	30	9.03	0.0052
1413.00	1732.60	4.1	40	9.34	0.0054
1413.00	1732.60	4.1	50	8.44	0.0049
1413.00	1732.60	4.1	60	7.05	0.0041
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1413.00	1732.60	4.35	-30	14.82	0.0086
1413.00	1732.60	4.35	-20	7.19	0.0041
1413.00	1732.60	4.35	-10	9.31	0.0054
1413.00	1732.60	4.35	0	8.50	0.0049
1413.00	1732.60	4.35	10	9.41	0.0054
1413.00	1732.60	4.35	20	7.40	0.0043
1413.00	1732.60	4.35	30	8.27	0.0048
1413.00	1732.60	4.35	40	-16.36	-0.0094
1413.00	1732.60	4.35	50	-13.47	-0.0078
1413.00	1732.60	4.35	60	9.60	0.0055

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 2B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**WCDMA Band IV 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	21.77	0.0144
1513.00	1752.6	3.6	-20	30.29	0.0200
1513.00	1752.6	3.6	-10	33.63	0.0222
1513.00	1752.6	3.6	0	30.46	0.0201
1513.00	1752.6	3.6	10	26.78	0.0177
1513.00	1752.6	3.6	20	20.54	0.0136
1513.00	1752.6	3.6	30	12.42	0.0082
1513.00	1752.6	3.6	40	-19.10	-0.0126
1513.00	1752.6	3.6	50	-13.44	-0.0089
1513.00	1752.6	3.6	60	12.95	0.0086
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1513.00	1752.6	4.1	-30	19.52	0.0129
1513.00	1752.6	4.1	-20	30.67	0.0203
1513.00	1752.6	4.1	-10	32.59	0.0215
1513.00	1752.6	4.1	0	29.65	0.0196
1513.00	1752.6	4.1	10	26.98	0.0178
1513.00	1752.6	4.1	20	20.69	0.0137
1513.00	1752.6	4.1	30	11.00	0.0073
1513.00	1752.6	4.1	40	-11.43	-0.0076
1513.00	1752.6	4.1	50	-15.91	-0.0105
1513.00	1752.6	4.1	60	-12.04	-0.0080
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1513.00	1752.6	4.35	-30	19.47	0.0129
1513.00	1752.6	4.35	-20	29.08	0.0192
1513.00	1752.6	4.35	-10	33.51	0.0221
1513.00	1752.6	4.35	0	30.91	0.0204
1513.00	1752.6	4.35	10	27.28	0.0180
1513.00	1752.6	4.35	20	20.60	0.0136
1513.00	1752.6	4.35	30	12.34	0.0082
1513.00	1752.6	4.35	40	-18.22	-0.0120
1513.00	1752.6	4.35	50	-21.41	-0.0141
1513.00	1752.6	4.35	60	-13.00	-0.0086



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



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 2 Conducted RF Emission Test Data cont'd

The following tests were performed on product RGF111LW.

#### Emission Designator Table

Frequency Rane (MHz)	Conducted Output Power (dBm)	Emission Designator	Band	Bandwidth (MHz)	Modulation
1850.7-1909.3	22.17	1M07G7D	LTE B2	1.4	QPSK
1850.7-1909.3	20.82	1M07D7W	LTE B2	1.4	16QAM
1851.5-1908.5	21.06	2M69G7D	LTE B2	3	QPSK
1851.5-1908.5	20.12	2M69D7W	LTE B2	3	16QAM
1852.5-1907.5	21.03	4M47G7D	LTE B2	5	QPSK
1852.5-1907.5	20.1	4M49D7W	LTE B2	5	16QAM
1855-1905	22.32	8M95G7D	LTE B2	10	QPSK
1855-1905	21.06	8M93D7W	LTE B2	10	16QAM
1857.5-1902.5	22.35	13M4G7D	LTE B2	15	QPSK
1857.5-1902.5	21.15	13M4D7W	LTE B2	15	16QAM
1860-1900	22.34	17M8G7D	LTE B2	20	QPSK
1860-1900	21.00	17M9D7W	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 18.64 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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
1852.400	18.58	17.81	17.84
1880.000	18.64	<b>17.87</b>	<b>17.87</b>
1907.600	18.64	17.81	17.84

**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 9.10 dB on middle channel in 20MHz bandwidth with 100 resource blocks.

**Measurement Plots for LTE Band 2**

Refer to the following measurement plots for more detail:

The following measurements were done on product RGF111LW:

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.

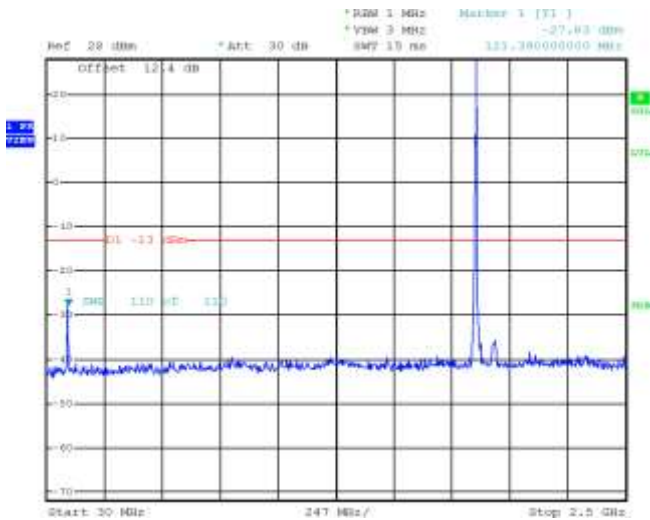
See Figures 3-25a to 3-36a for the plots of the Channel mask.

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

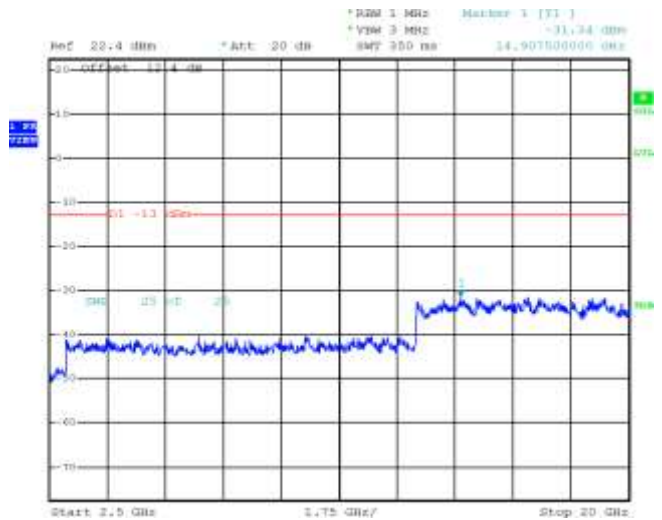
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data (cont'd)

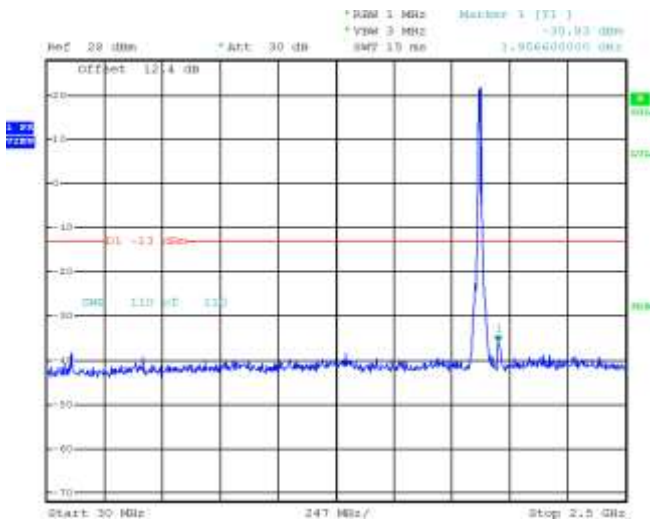
**Figure 3-1a: Band 2, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 100)**



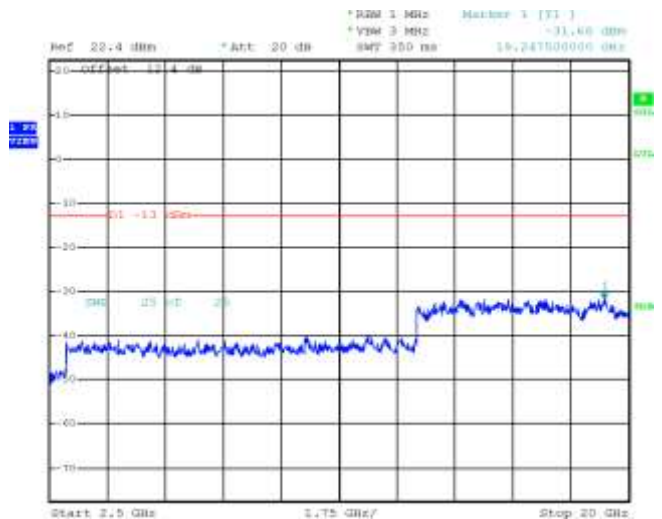
**Figure 3-2a: Band 2, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 100)**



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



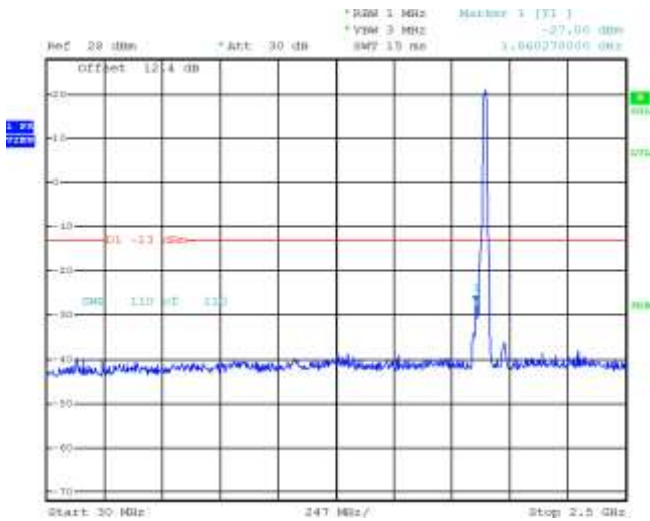
**Figure 3-4a: Band 2, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 100)**



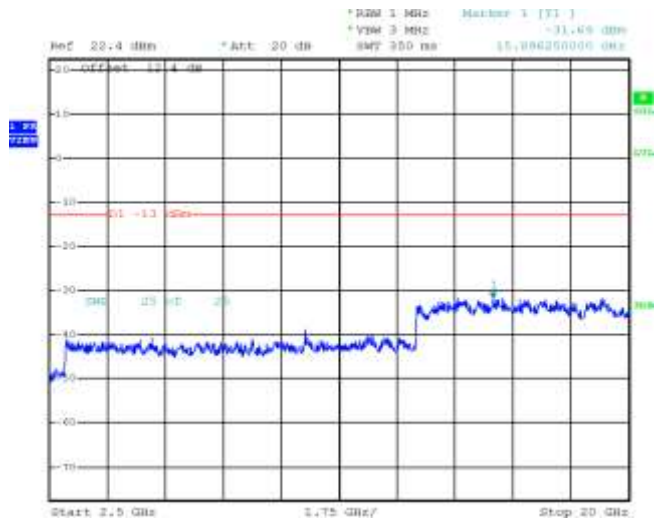
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

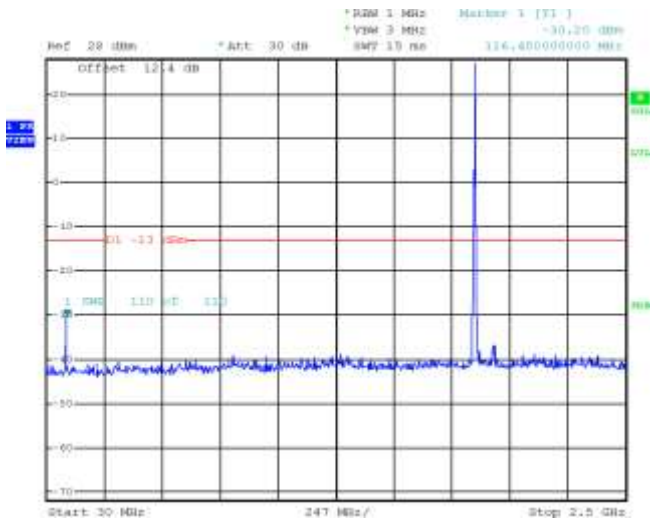
**Figure 3-5a: Band 2, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)**



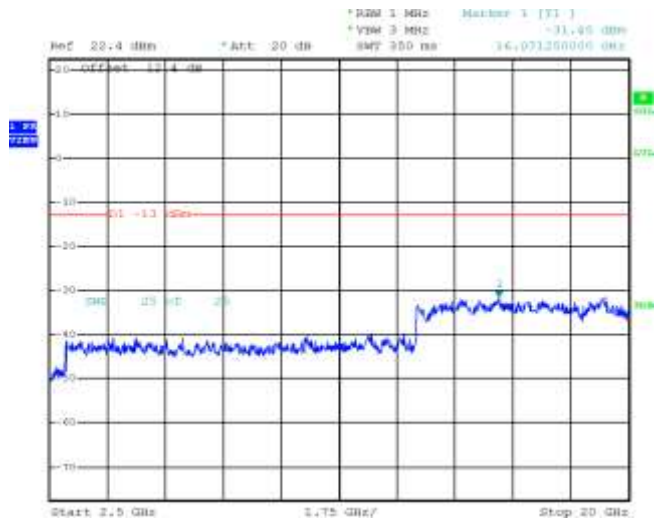
**Figure 3-6a: Band 2, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)**



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



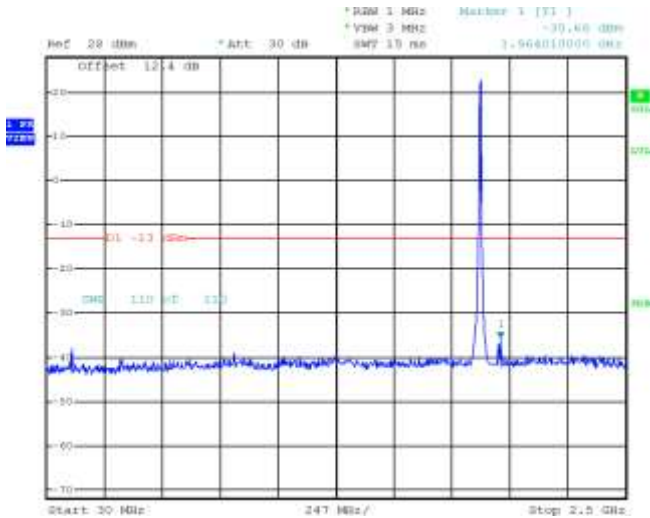
**Figure 3-8a: Band 2, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 50)**



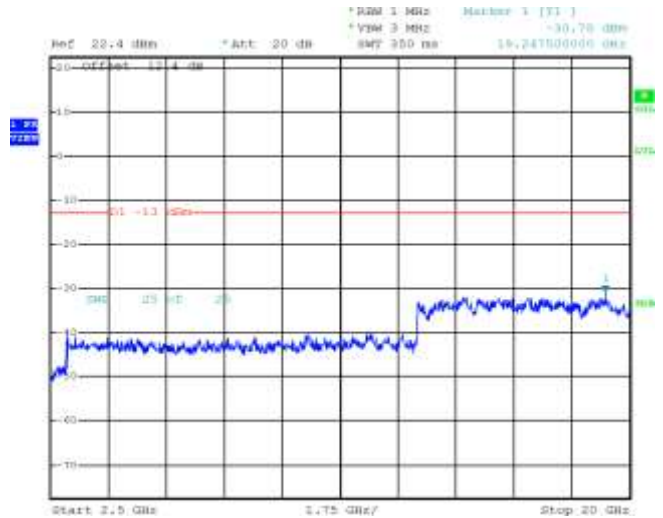
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

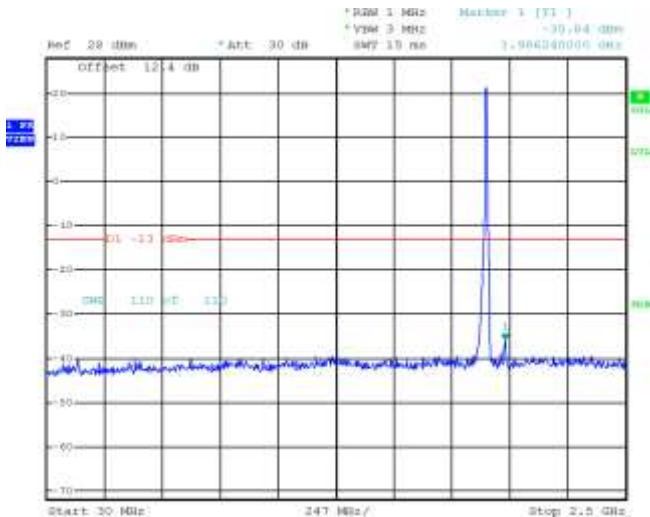
**Figure 3-9a: Band 2, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 50)**



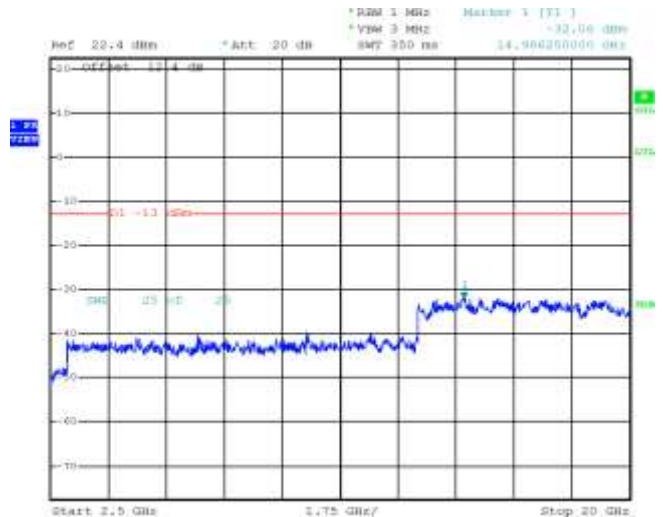
**Figure 3-10a: Band 2, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 50)**



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



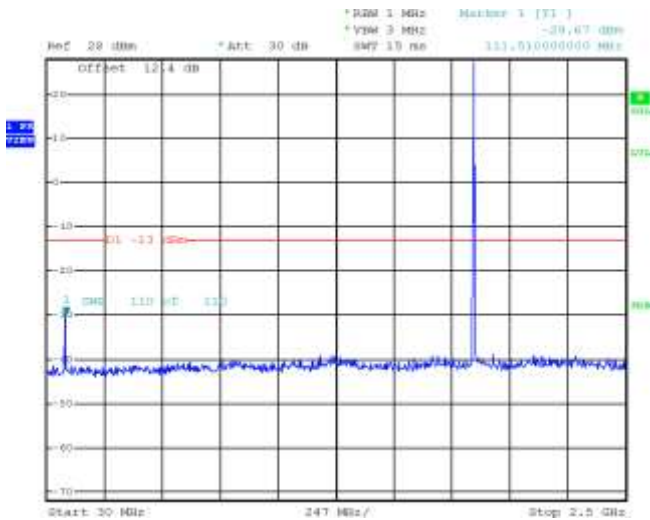
**Figure 3-12a: Band 2, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)**



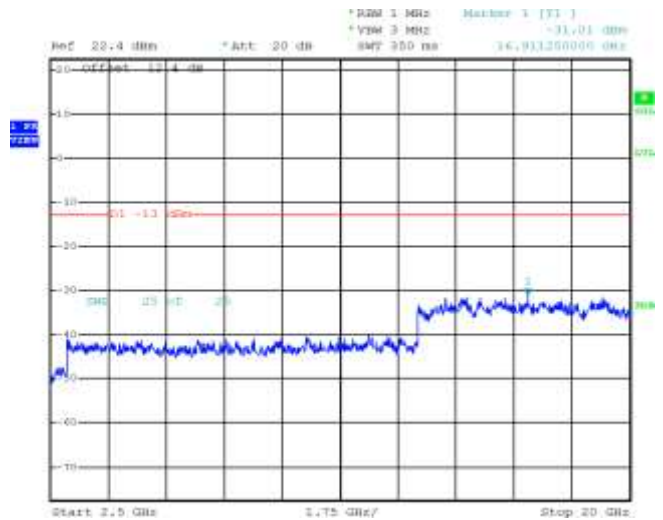
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

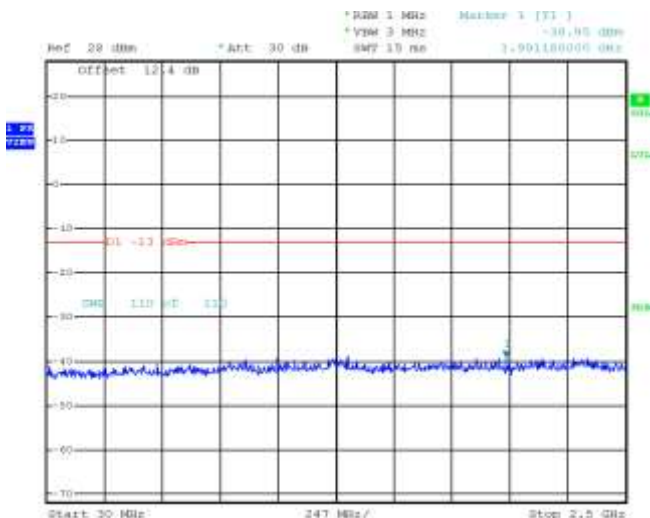
**Figure 3-13a: Band 2, Spurious Conducted Emissions, Low channel, 1.4MHz BW (RB= 6)**



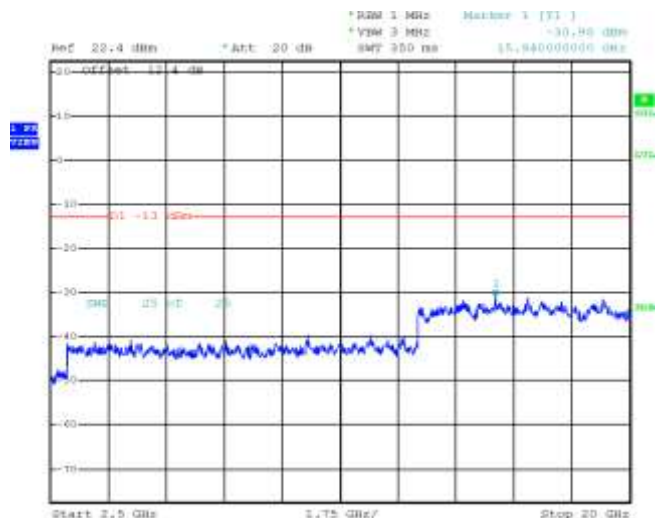
**Figure 3-14a: Band 2, Spurious Conducted Emissions, Low channel, 1.4MHz BW (RB= 6)**



**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)**

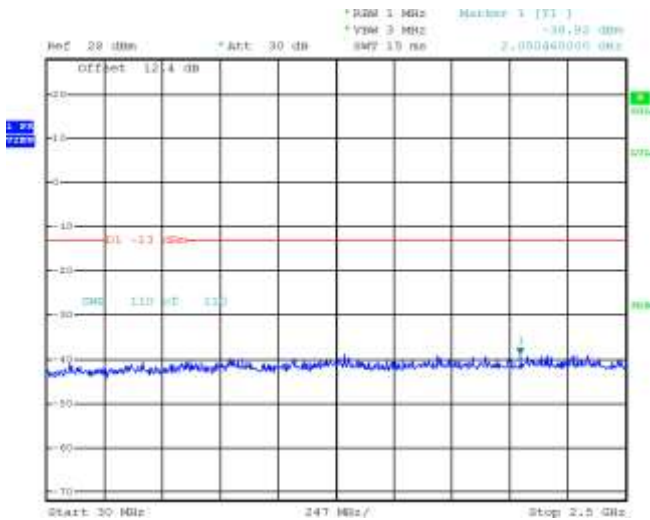




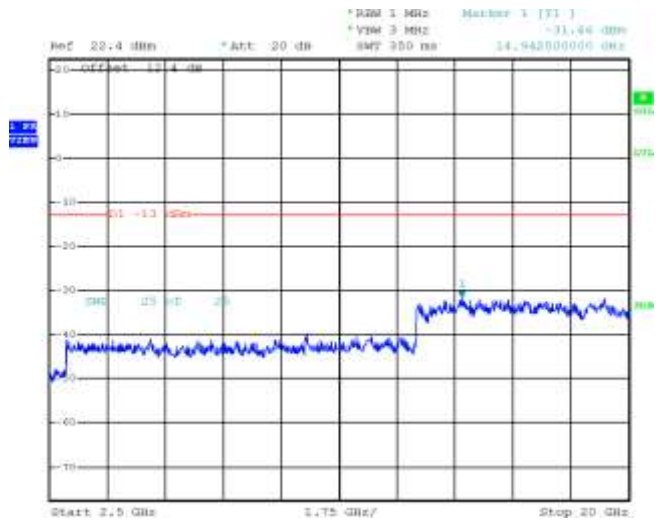
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

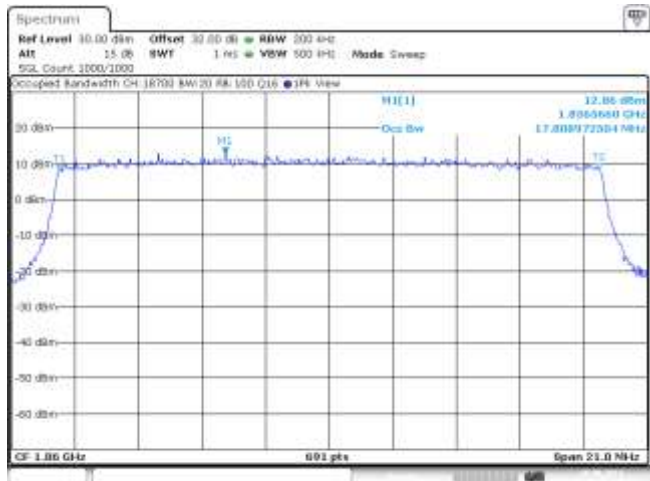
**Figure 3-17a: Band 2, Spurious Conducted Emissions, High Channel, 1.4MHz BW (RB= 6)**



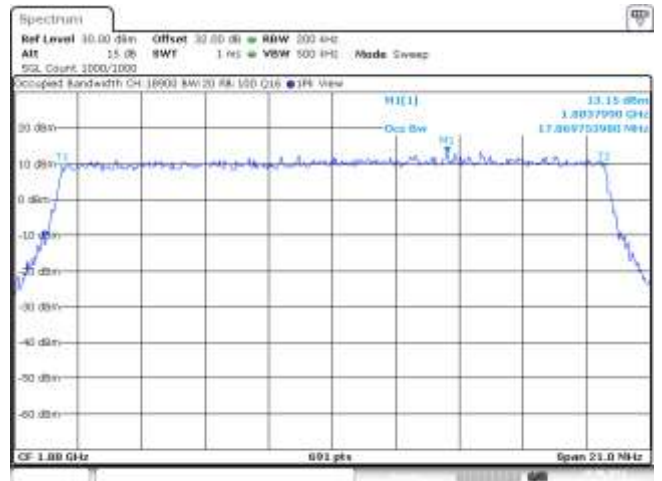
**Figure 3-18a: Band 2, Spurious Conducted Emissions, High Channel, 1.4MHz BW (RB= 6)**



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



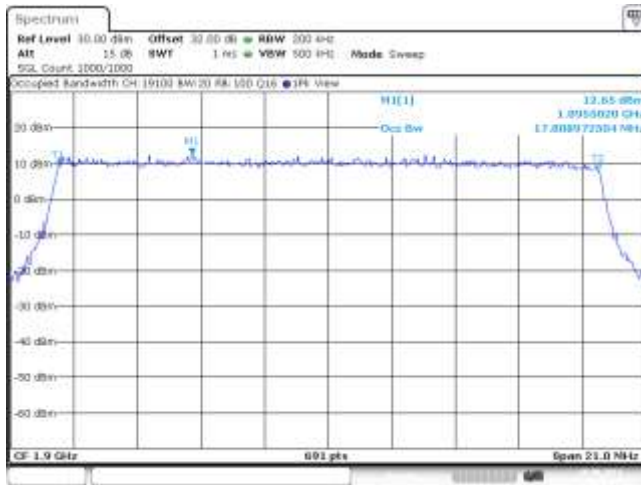
**Figure 3-20a: Occupied Bandwidth, Band 2 Middle Channel, 20MHz BW (RB= 100)**



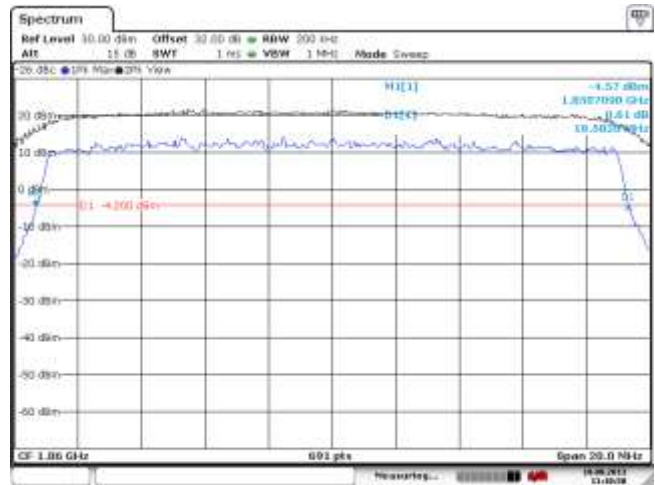
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

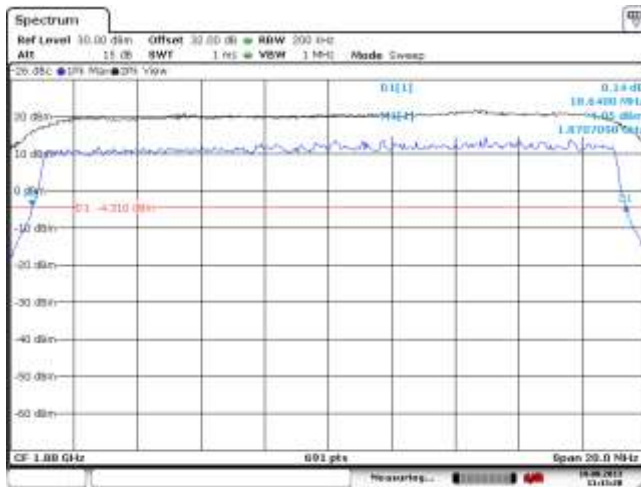
**Figure 3-21a: Occupied Bandwidth, Band 2 High Channel, 20MHz BW (RB= 100)**



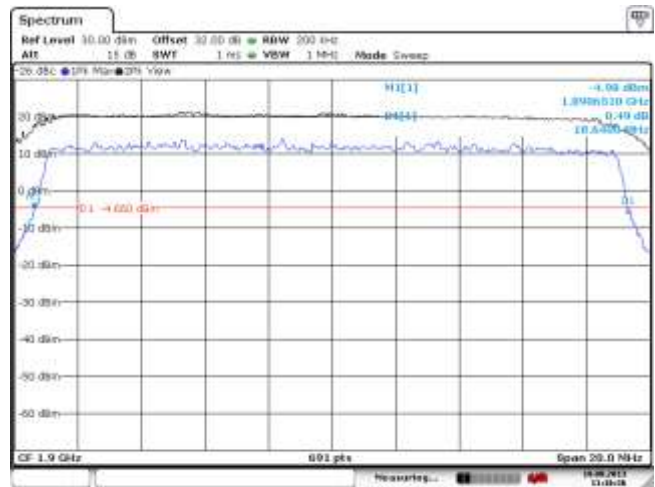
**Figure 3-22a: -26 dBc Bandwidth, Band 2 Low Channel, 20MHz BW (RB= 100)**



**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)**

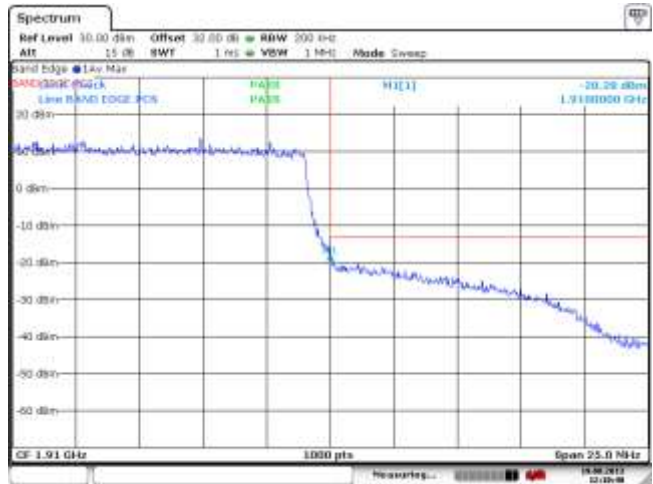
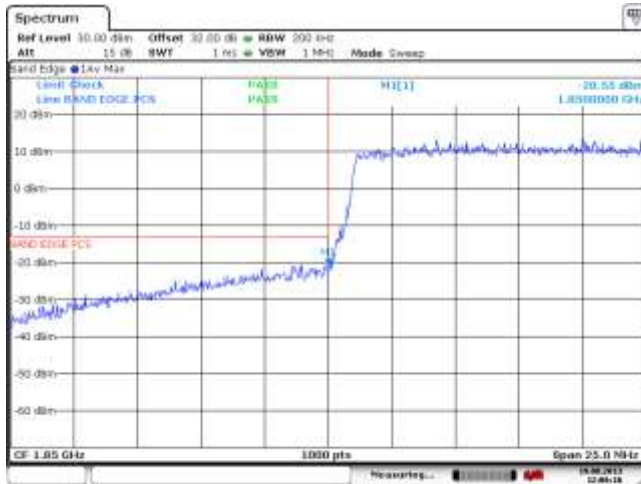


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

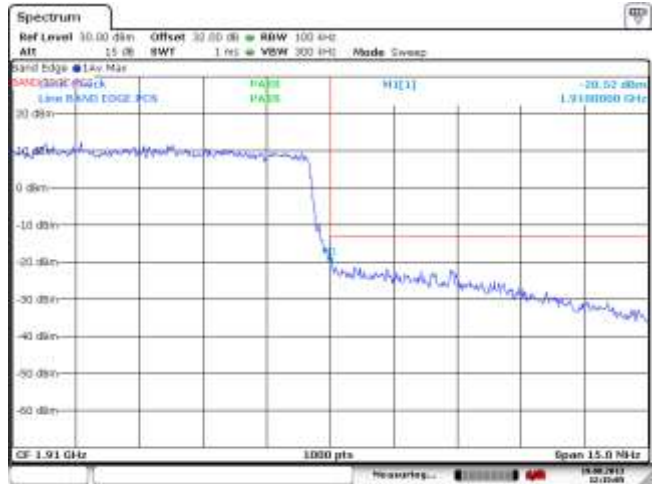
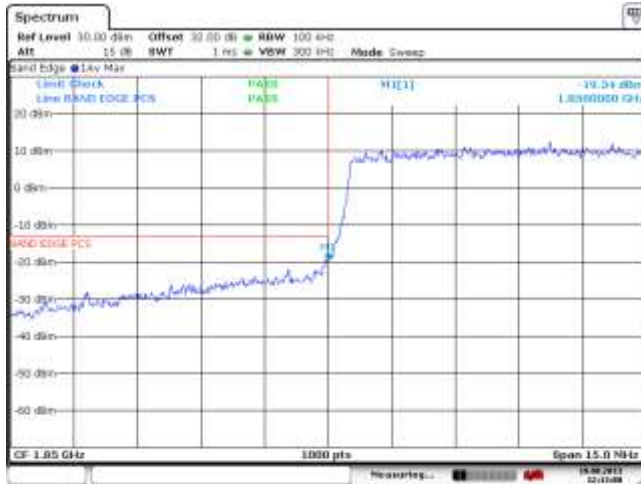
**Figure 3-25a: Band 2 Low Channel Mask, 20MHz BW, RB = 100**

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



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

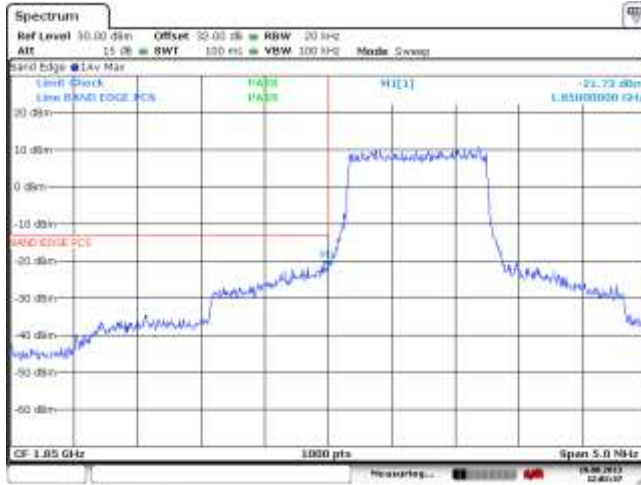
**Figure 3-28a: Band 2 High Channel Mask, 10MHz BW, RB = 50**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

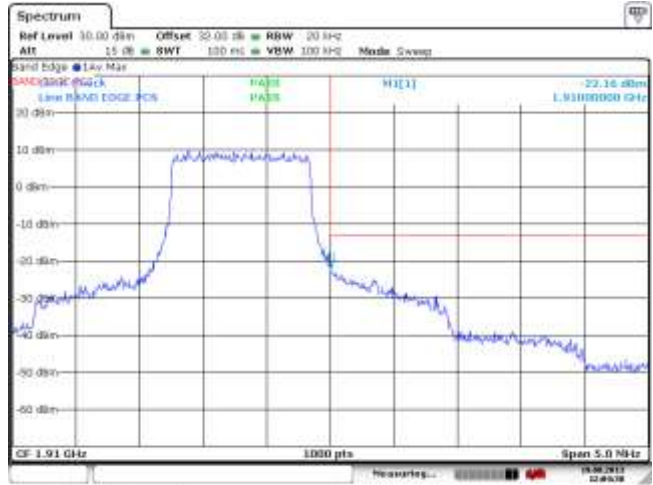
LTE Band 2 Conducted RF Emission Test Data cont'd

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



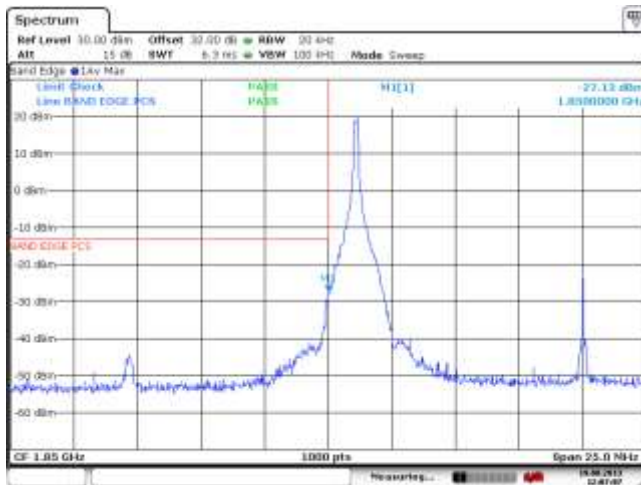
DATA: 13\_AUG\_2013\_121011T

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



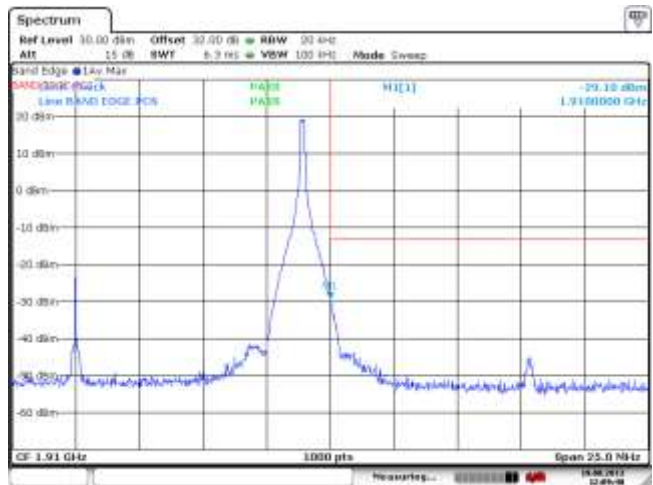
DATA: 13\_AUG\_2013\_121011E

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



DATA: 13\_AUG\_2013\_121011F

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

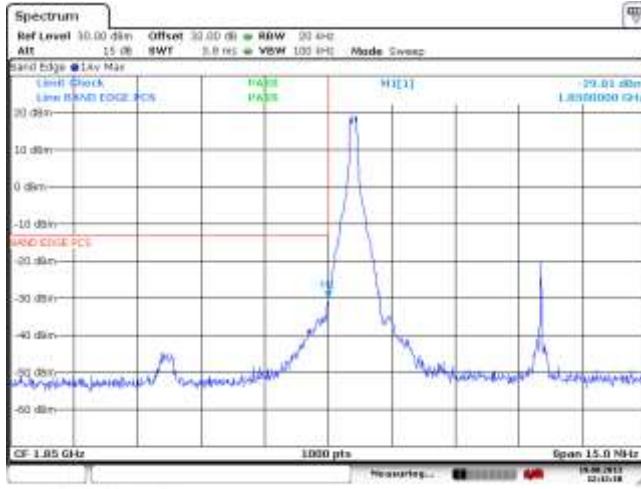


DATA: 13\_AUG\_2013\_121011G

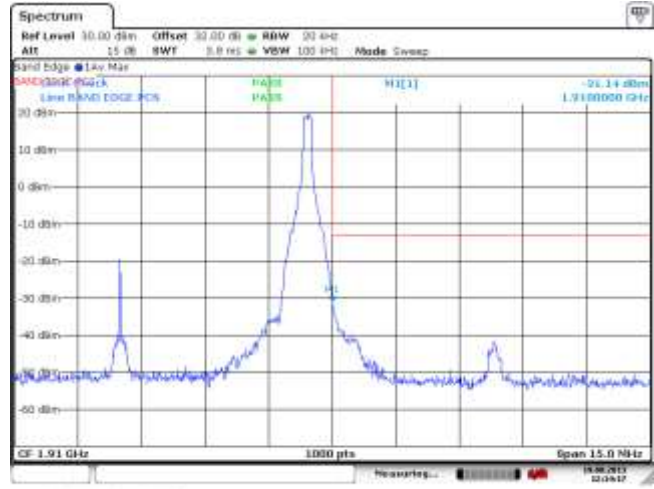
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 2 Conducted RF Emission Test Data cont'd

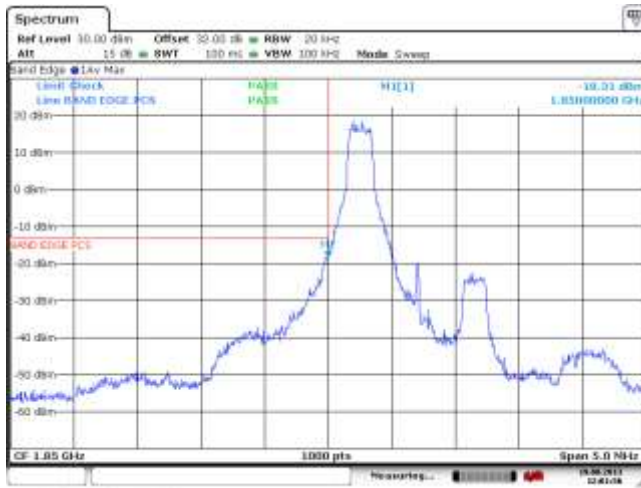
**Figure 3-33a: Band 2 Low Channel Mask, 10MHz  
BW, RB = 1**



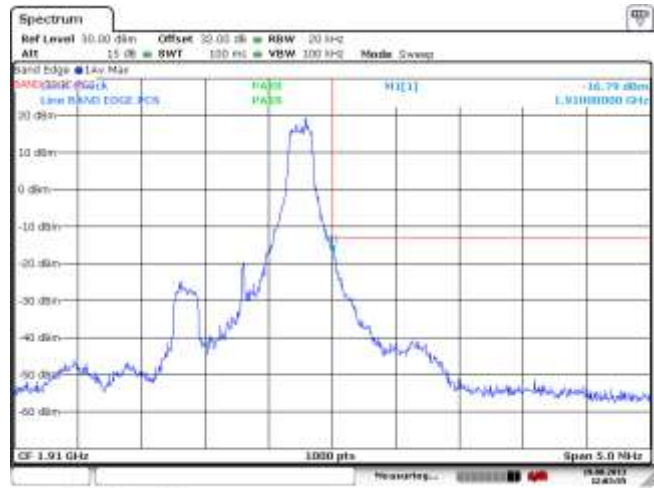
**Figure 3-34a: Band 2 High Channel Mask, 10MHz  
BW, RB = 1**



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



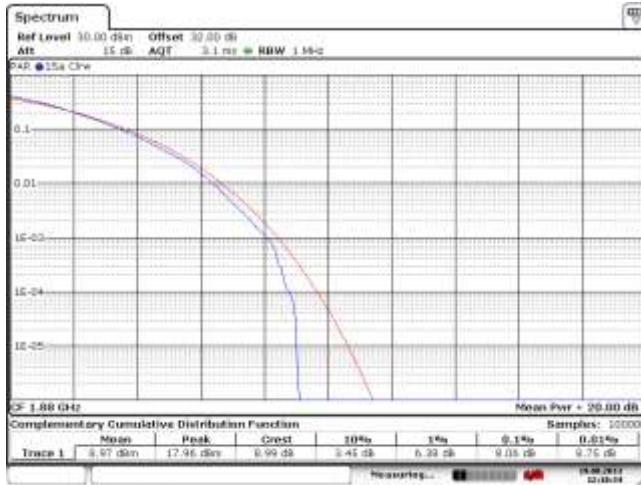
**Figure 3-36a: Band 2 High Channel Mask, 1.4MHz  
BW, RB = 1**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

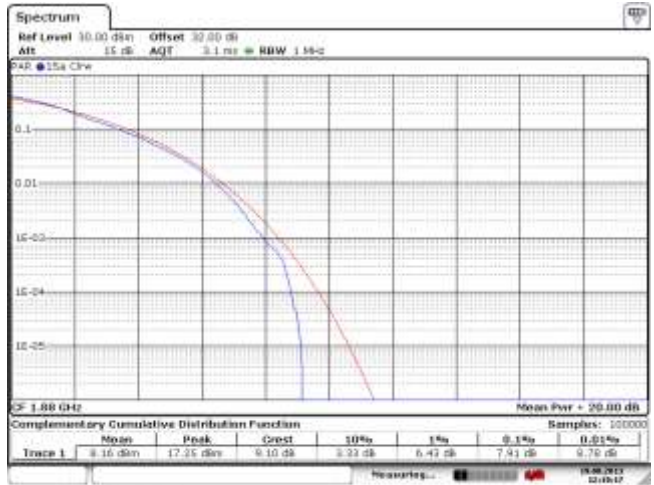
LTE Band 2 Conducted RF Emission Test Data cont'd

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



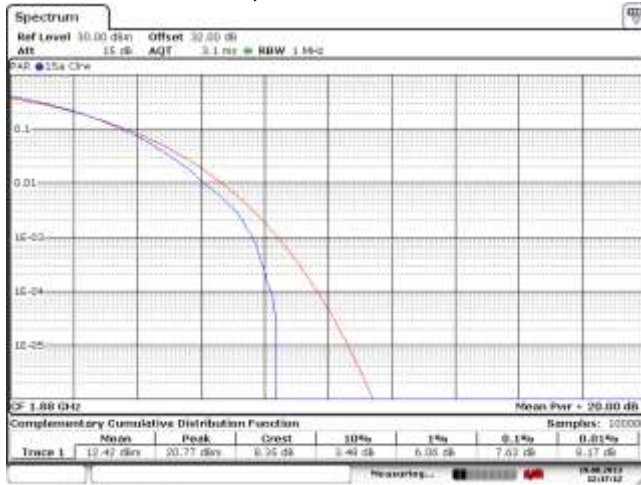
DATA: 13\_AUG\_2013 12:10:34

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



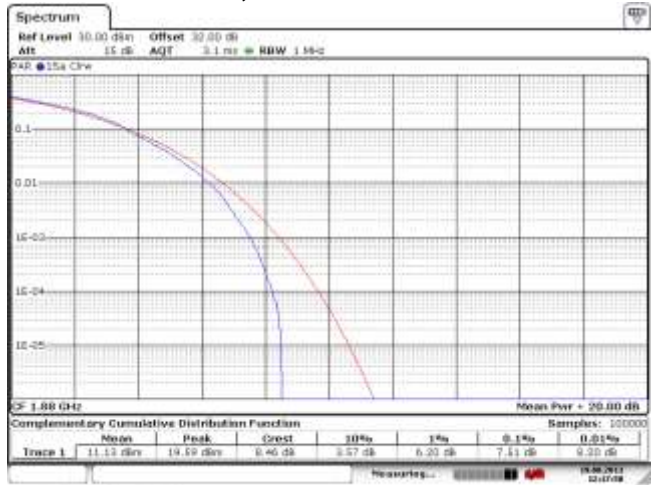
DATA: 13\_AUG\_2013 12:10:17

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



DATA: 13\_AUG\_2013 12:07:12

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

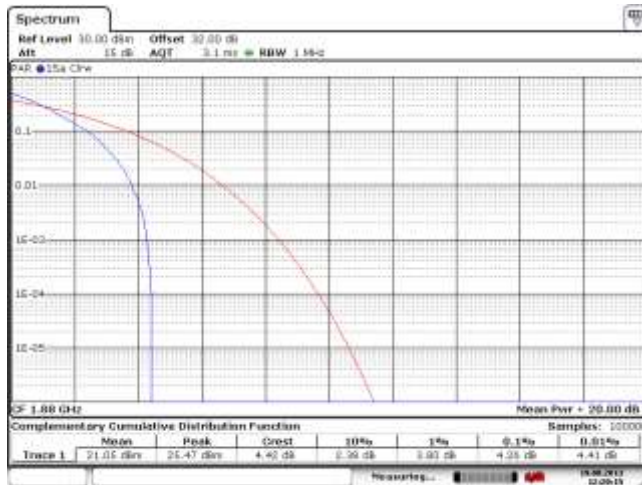


DATA: 13\_AUG\_2013 12:07:52

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

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**

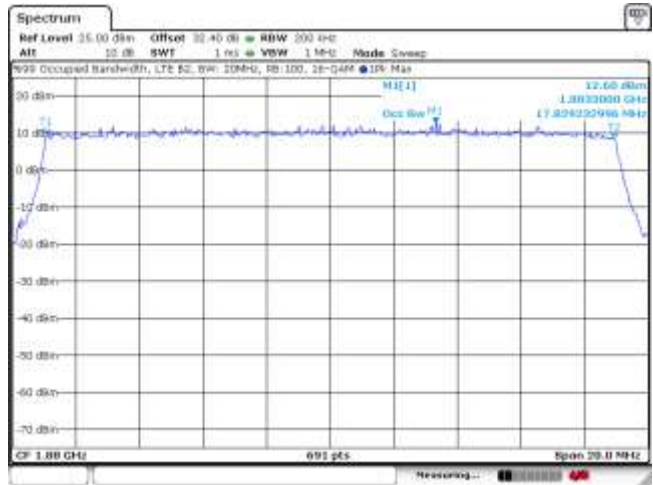
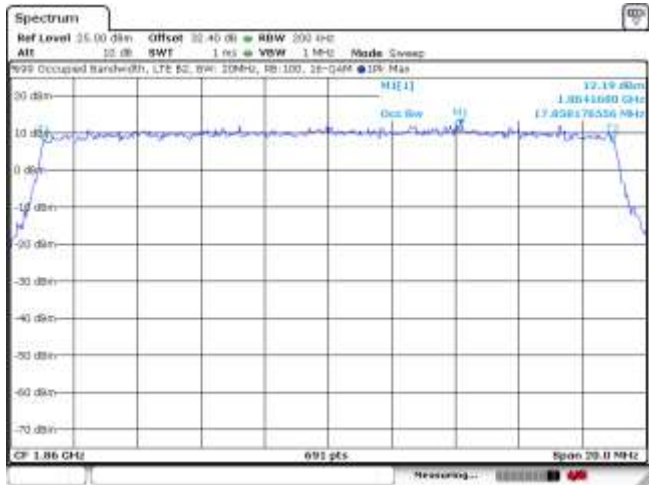


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

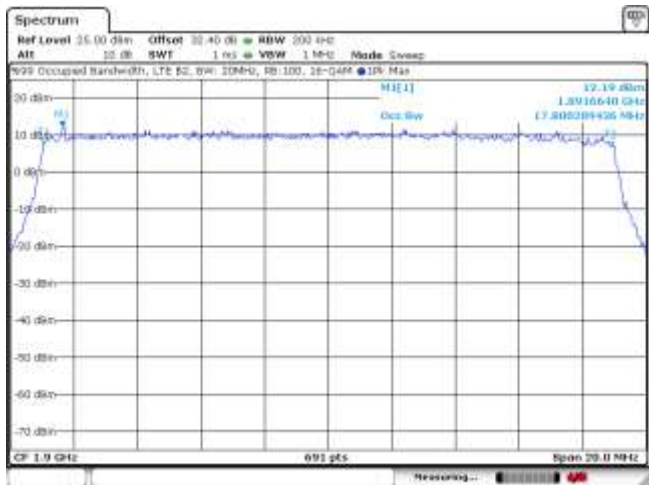
LTE Band 2 Conducted RF Emission Test Data cont'd

**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**

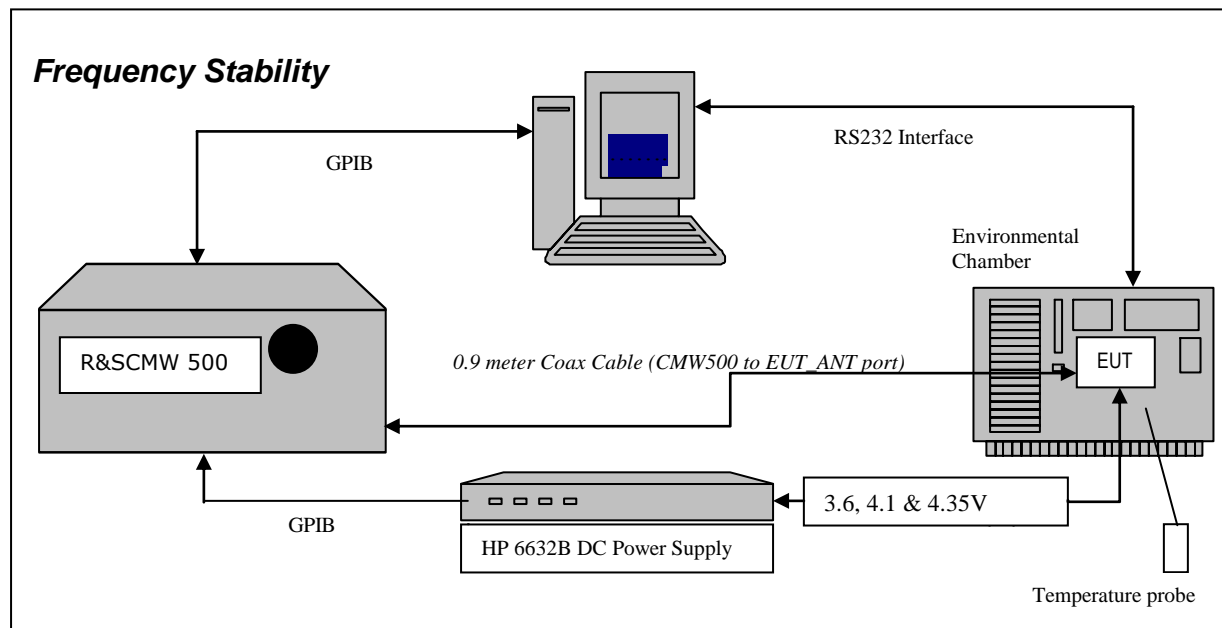




## APPENDIX 3B – LTE Band 2 FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Frequency Stability Test Data



The following measurements were performed by Chuan Tran.

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 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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 **0.0082 PPM.**

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following tests were performed on product RGF111LW.

Date of test: August 19, 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	7.6	0.0041
18900	1880.0	3.6	20	11.44	0.0061
19199	1900.0	3.6	20	-6.74	-0.0035

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	20	8.08	0.0043
18900	1880.0	4.1	20	8.81	0.0047
19199	1900.0	4.1	20	-8.54	-0.0045

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	20	11.24	0.006
18900	1880.0	4.35	20	10.04	0.0053
19199	1900.0	4.35	20	-9.7	-0.0051

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	9.74	0.0052
18600	1860.0	3.6	-20	8.68	0.0047
18600	1860.0	3.6	-10	<b>15.22</b>	<b>0.0082</b>
18600	1860.0	3.6	0	6.45	0.0035
18600	1860.0	3.6	10	13.86	0.0075
18600	1860.0	3.6	20	7.6	0.0041
18600	1860.0	3.6	30	-4.71	-0.0025
18600	1860.0	3.6	40	8.48	0.0046
18600	1860.0	3.6	50	8.45	0.0045
18600	1860.0	3.6	60	8.27	0.0044
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	-30	7.3	0.0039
18600	1860.0	4.1	-20	7.24	0.0039
18600	1860.0	4.1	-10	7.74	0.0042
18600	1860.0	4.1	0	8.93	0.0048
18600	1860.0	4.1	10	-13.06	-0.007
18600	1860.0	4.1	20	8.08	0.0043
18600	1860.0	4.1	30	5.76	0.0031
18600	1860.0	4.1	40	9.34	0.005
18600	1860.0	4.1	50	7.34	0.0039
18600	1860.0	4.1	60	-8.04	-0.0043
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	-30	8.81	0.0047
18600	1860.0	4.35	-20	9.17	0.0049
18600	1860.0	4.35	-10	7.24	0.0039
18600	1860.0	4.35	0	-8.12	-0.0044
18600	1860.0	4.35	10	-6.49	-0.0035
18600	1860.0	4.35	20	11.24	0.006
18600	1860.0	4.35	30	7.82	0.0042
18600	1860.0	4.35	40	6.25	0.0034
18600	1860.0	4.35	50	6.75	0.0036
18600	1860.0	4.35	60	7.94	0.0043

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	5.34	0.0028
18900	1880.00	3.6	-20	10.4	0.0055
18900	1880.00	3.6	-10	8.8	0.0047
18900	1880.00	3.6	0	-3.65	-0.0019
18900	1880.00	3.6	10	7.25	0.0039
18900	1880.00	3.6	20	11.44	0.0061
18900	1880.00	3.6	30	5.22	0.0028
18900	1880.00	3.6	40	8.65	0.0046
18900	1880.00	3.6	50	7.78	0.0041
18900	1880.00	3.6	60	3.83	0.002
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.1	-30	11.06	0.0059
18900	1880.00	4.1	-20	7.61	0.004
18900	1880.00	4.1	-10	8.94	0.0048
18900	1880.00	4.1	0	4.52	0.0024
18900	1880.00	4.1	10	9.31	0.005
18900	1880.00	4.1	20	8.81	0.0047
18900	1880.00	4.1	30	9.74	0.0052
18900	1880.00	4.1	40	7.17	0.0038
18900	1880.00	4.1	50	9.11	0.0048
18900	1880.00	4.1	60	10.03	0.0053
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.35	-30	9.31	0.005
18900	1880.00	4.35	-20	9.7	0.0052
18900	1880.00	4.35	-10	9.4	0.005
18900	1880.00	4.35	0	-5.41	-0.0029
18900	1880.00	4.35	10	9.88	0.0053
18900	1880.00	4.35	20	10.04	0.0053
18900	1880.00	4.35	30	6.24	0.0033
18900	1880.00	4.35	40	8	0.0043
18900	1880.00	4.35	50	8.64	0.0046
18900	1880.00	4.35	60	8.47	0.0045

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 3B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	7.07	0.0037
19199	1900.0	3.6	-20	6.29	0.0033
19199	1900.0	3.6	-10	-7.08	-0.0037
19199	1900.0	3.6	0	6.2	0.0033
19199	1900.0	3.6	10	-6.74	-0.0035
19199	1900.0	3.6	20	-6.74	-0.0035
19199	1900.0	3.6	30	-5.74	-0.003
19199	1900.0	3.6	40	-7.21	-0.0038
19199	1900.0	3.6	50	-8.64	-0.0045
19199	1900.0	3.6	60	-6.31	-0.0033
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.1	-30	-8.53	-0.0045
19199	1900.0	4.1	-20	-8.38	-0.0044
19199	1900.0	4.1	-10	-6.45	-0.0034
19199	1900.0	4.1	0	7.32	0.0039
19199	1900.0	4.1	10	-7.35	-0.0039
19199	1900.0	4.1	20	-8.54	-0.0045
19199	1900.0	4.1	30	-6.21	-0.0033
19199	1900.0	4.1	40	-9.87	-0.0052
19199	1900.0	4.1	50	-7.51	-0.004
19199	1900.0	4.1	60	-6.72	-0.0035
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.35	-30	-9.27	-0.0049
19199	1900.0	4.35	-20	-8.31	-0.0044
19199	1900.0	4.35	-10	-9.03	-0.0048
19199	1900.0	4.35	0	6.21	0.0033
19199	1900.0	4.35	10	-9.14	-0.0048
19199	1900.0	4.35	20	-9.7	-0.0051
19199	1900.0	4.35	30	-9.66	-0.0051
19199	1900.0	4.35	40	-9.03	-0.0048
19199	1900.0	4.35	50	-6.35	-0.0033
19199	1900.0	4.35	60	-8.44	-0.0044



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



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 5 Conducted RF Emission Test Data cont'd

The following tests were performed on product RGF111LW.

#### **Emission Designator Table**

<b>Frequency Range (MHz)</b>	<b>Conducted Output Power (dBm)</b>	<b>Emission Designator</b>	<b>Band</b>	<b>Bandwidth (MHz)</b>	<b>Modulation</b>
824.7-848.2	23.73	1M08G7D	LTE B5	1.4	QPSK
824.7-848.2	22.50	1M08D7W	LTE B5	1.4	16QAM
825.5-847.5	23.80	2M69G7D	LTE B5	3	QPSK
825.5-847.5	22.85	2M68D7W	LTE B5	3	16QAM
826.5-846.4	23.77	4M47G7D	LTE B5	5	QPSK
826.5-846.4	23.08	4M47D7W	LTE B5	5	16QAM
829-844	23.78	8M93G7D	LTE B5	10	QPSK
829-844	22.65	8M92D7W	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 9.316 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	8.915	<b>8.915</b>
836.5	9.316	<b>8.931</b>	<b>8.915</b>
843.9	9.219	8.883	8.883

**Measurement Plots for LTE Band 5**

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

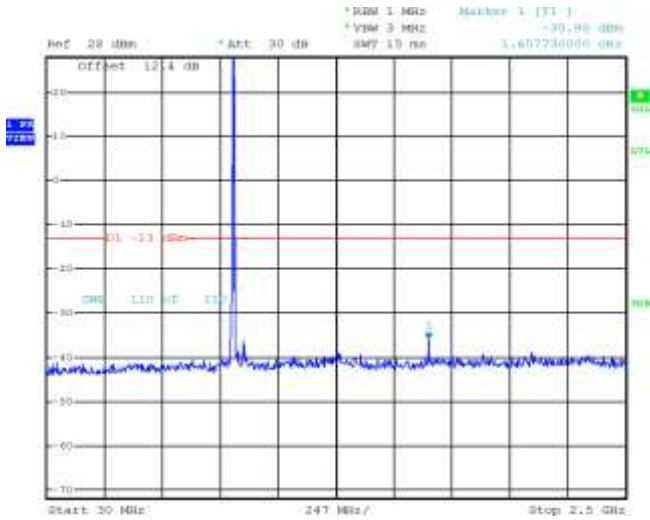
See Figures 4-19a to 4-36a and 4-45a to 4-47a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

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

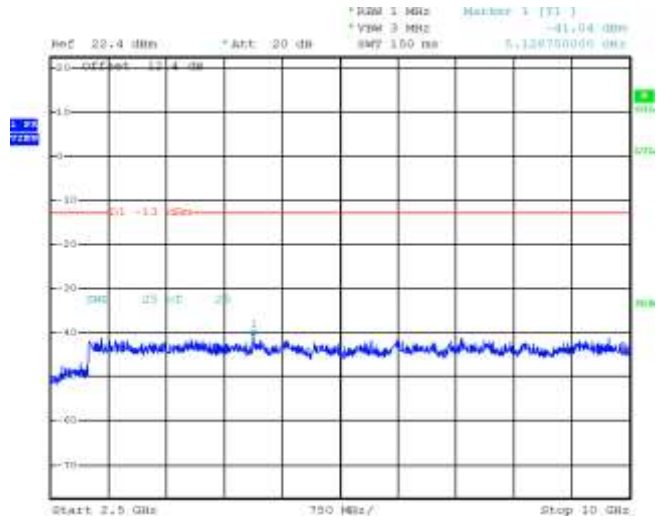
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

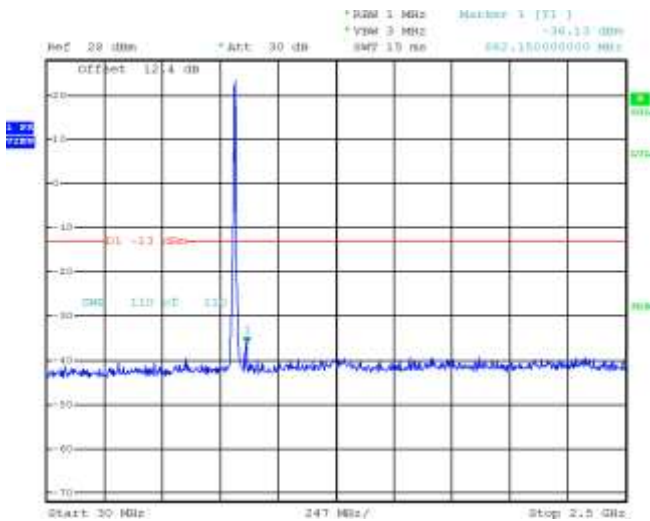
**Figure 4-1a: Band 5, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)**



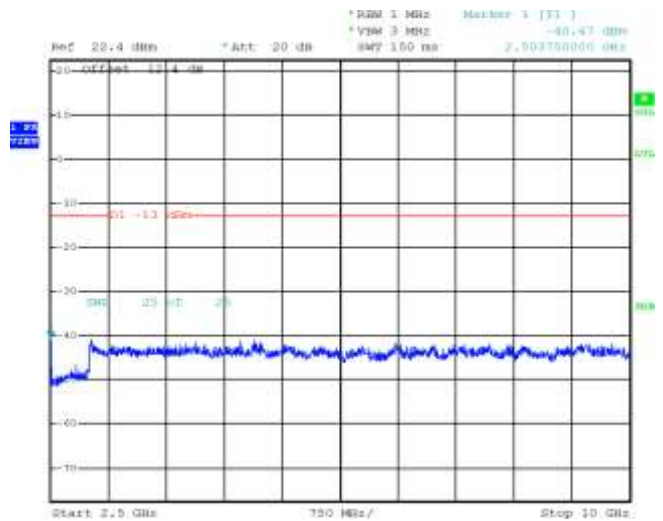
**Figure 4-2a: Band 5, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)**



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



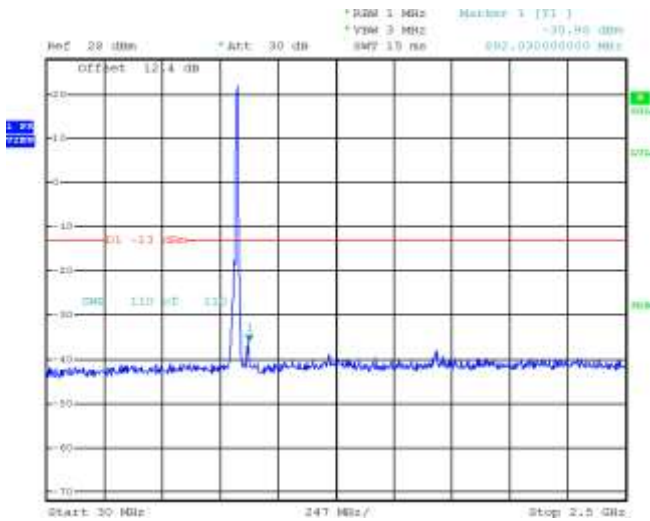
**Figure 4-4a: Band 5, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)**



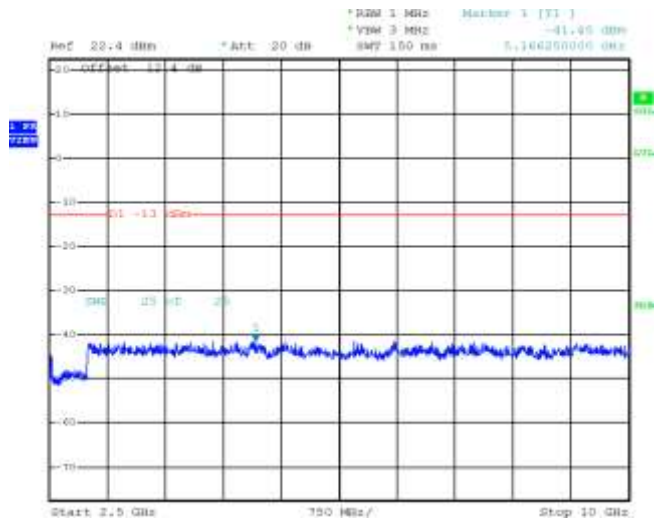
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

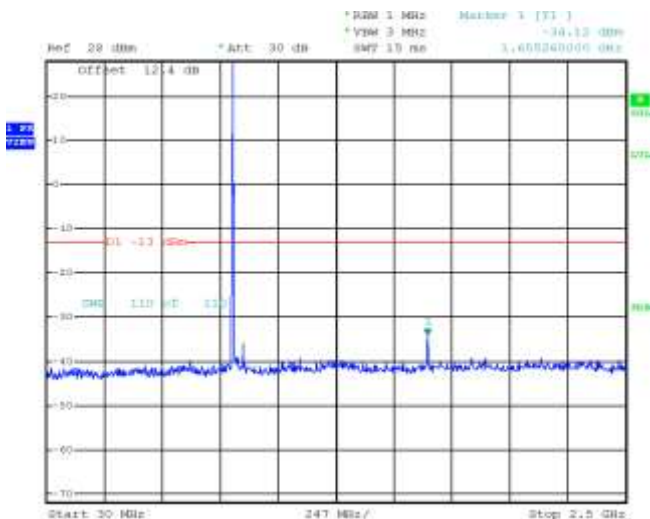
**Figure 4-5a: Band 5, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)**



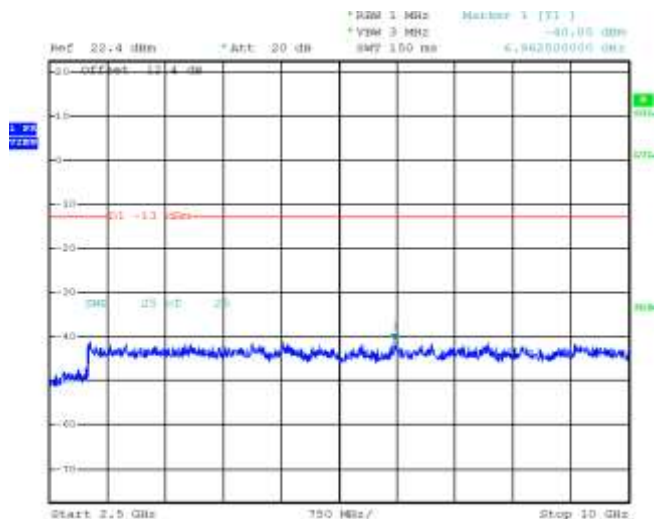
**Figure 4-6a: Band 5, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)**



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



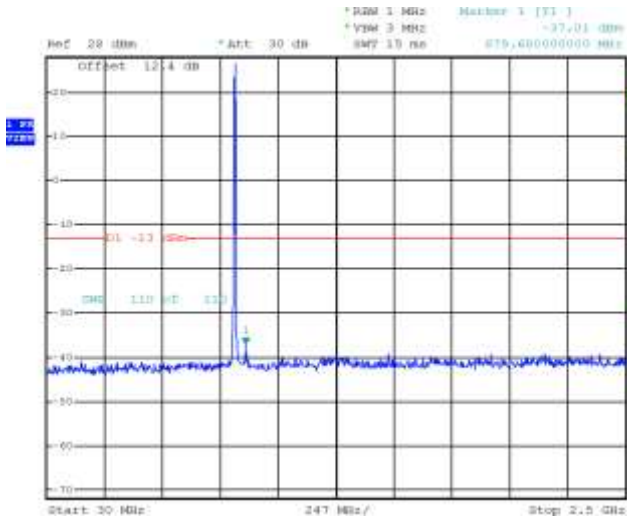
**Figure 4-8a: Band 5, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)**



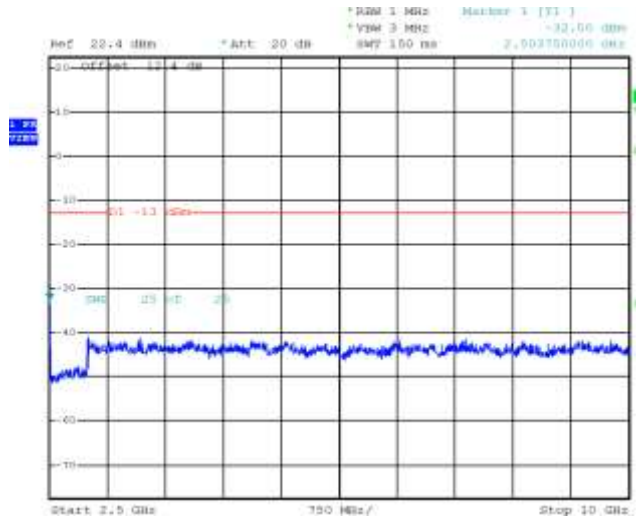
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

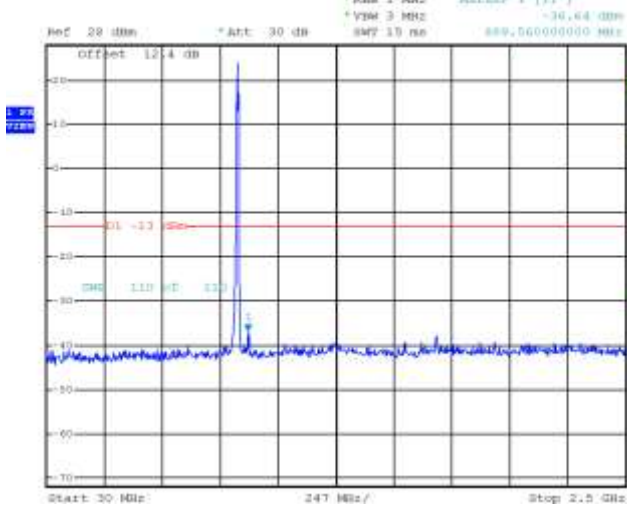
**Figure 4-9a: Band 5, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)**



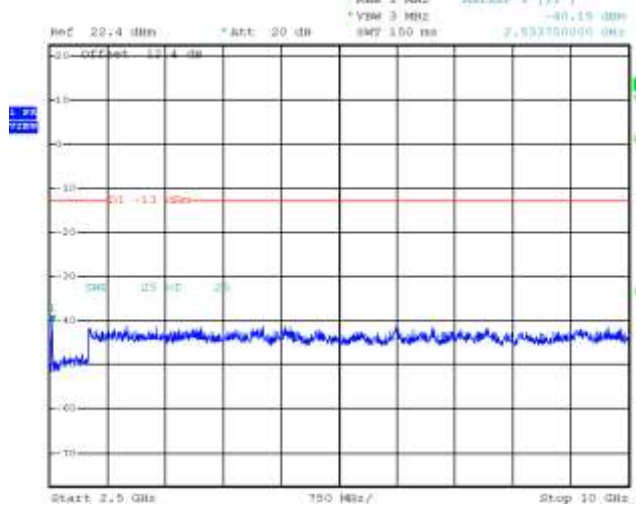
**Figure 4-10a: Band 5, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)**



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



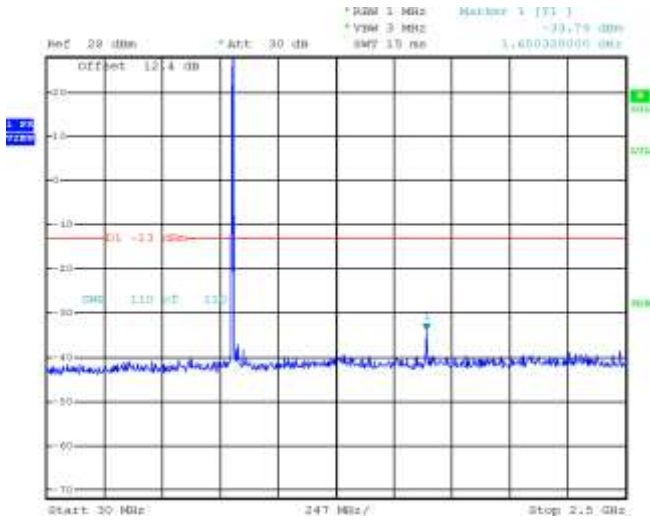
**Figure 4-12a: Band 5, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)**



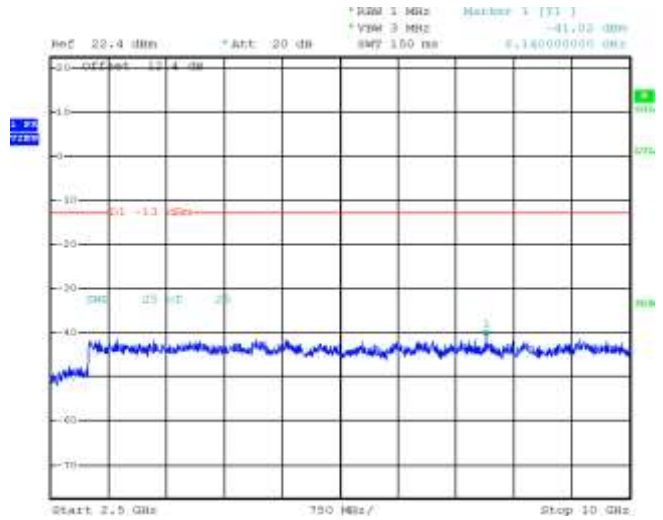
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

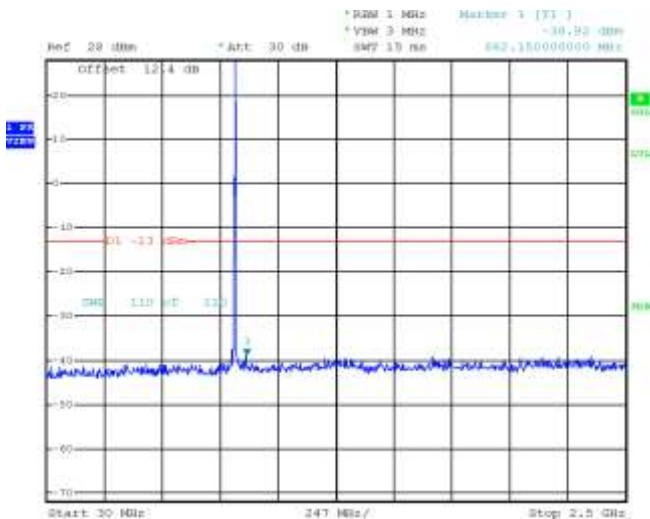
**Figure 4-13a: Band 5, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)**



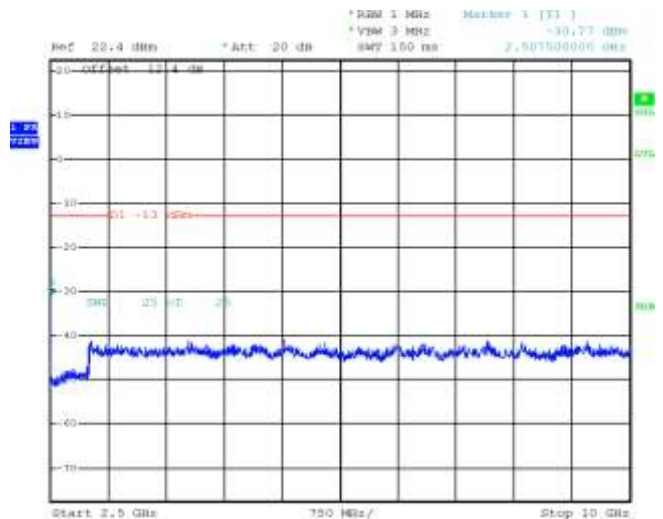
**Figure 4-14a: Band 5, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)**



**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)**

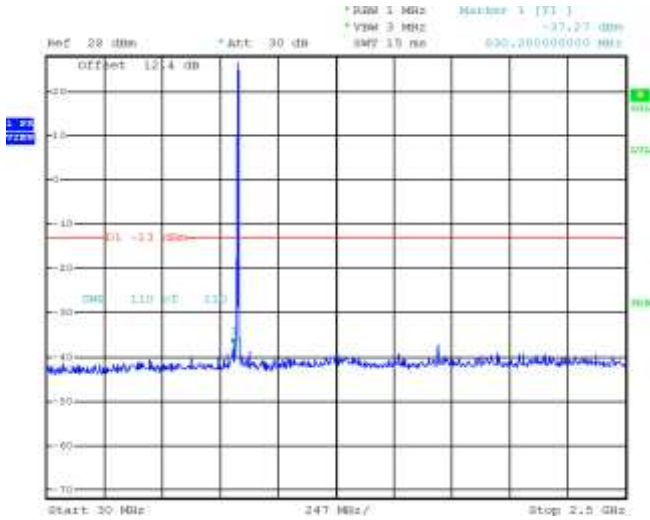




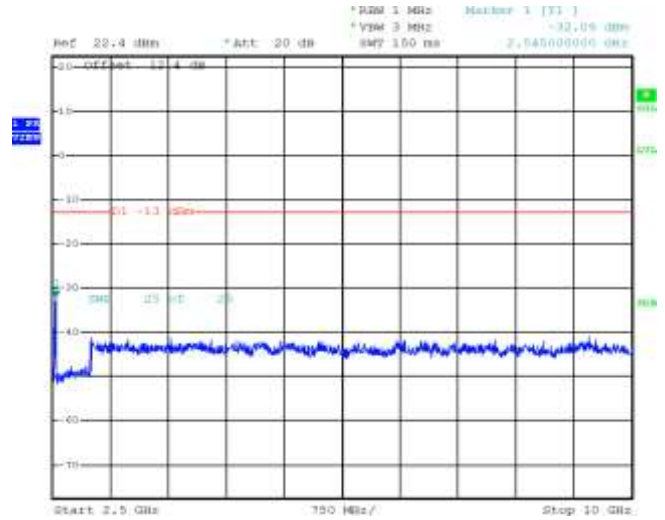
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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)**



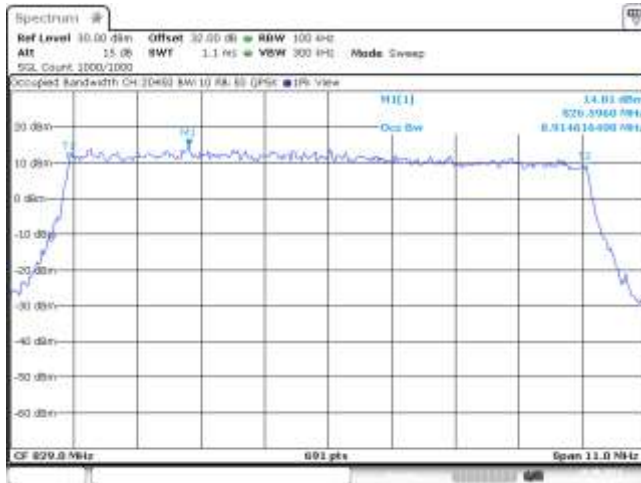
**Figure 4-18a: Band 5, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

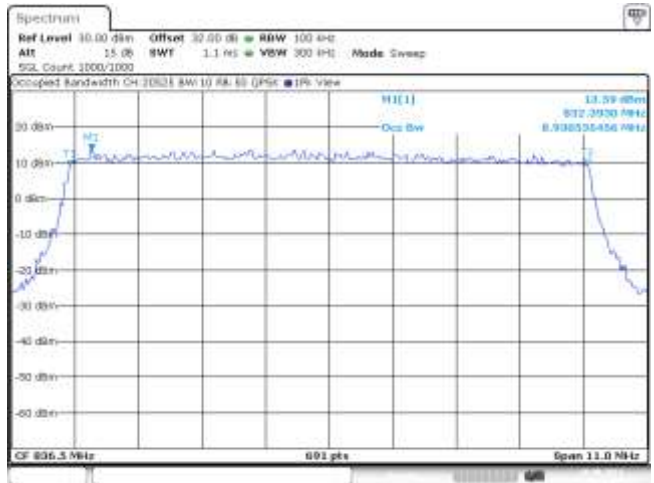
LTE Band 5 Conducted RF Emission Test Data cont'd

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



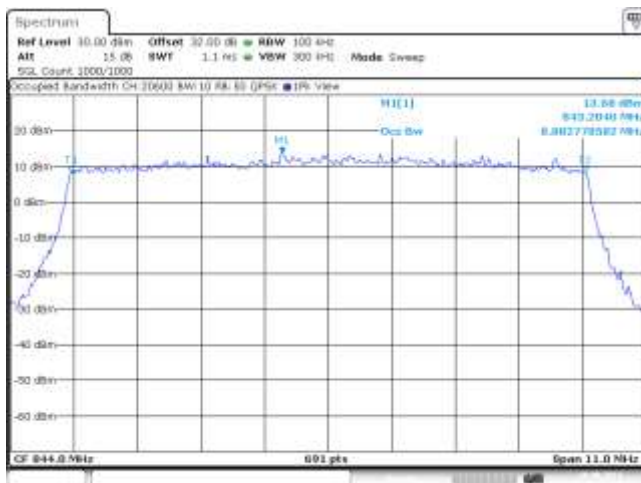
DATA: 13\_Ant\_0013\_1433148

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



DATA: 13\_Ant\_0013\_1433638

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

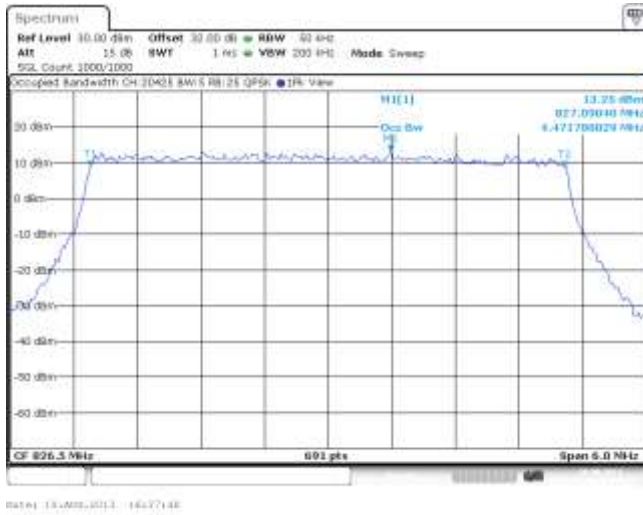


DATA: 13\_Ant\_0013\_1433626

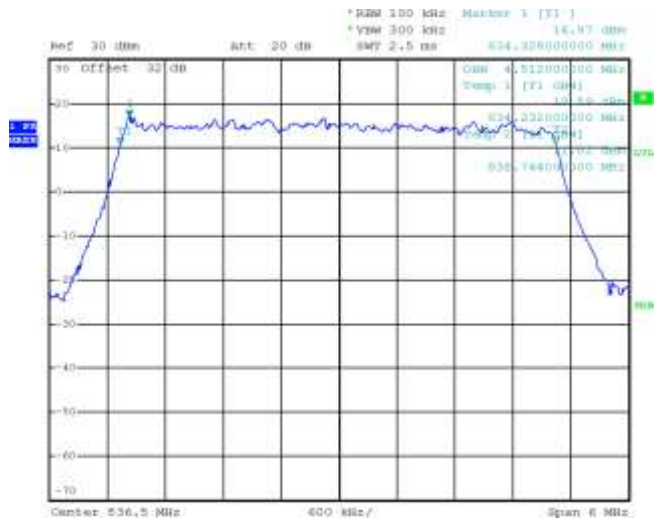
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

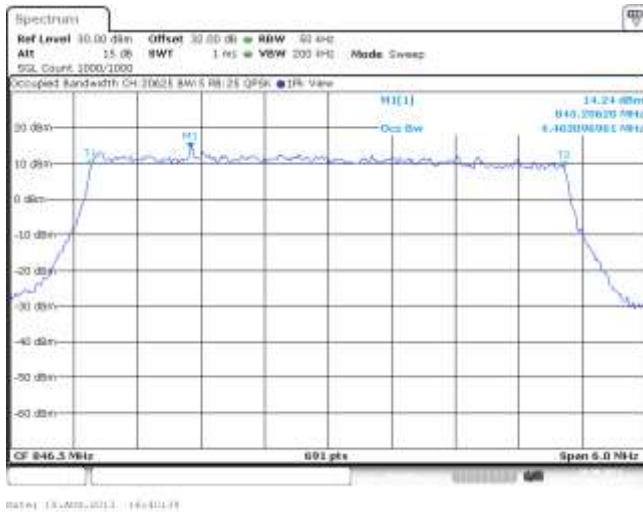
**Figure 4-22a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25**



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



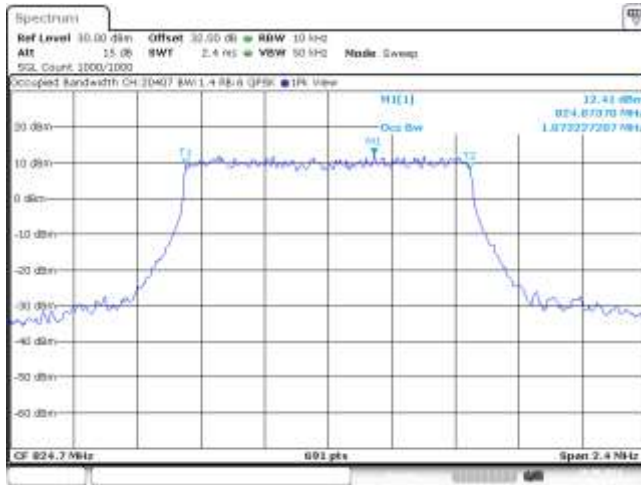
**Figure 4-24a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=25**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

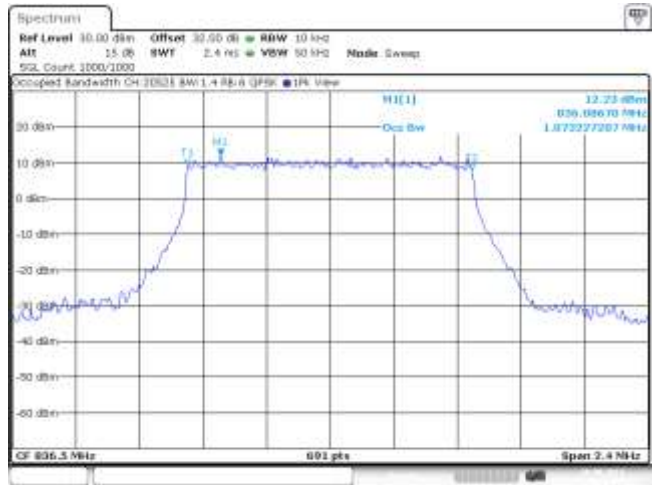
LTE Band 5 Conducted RF Emission Test Data cont'd

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



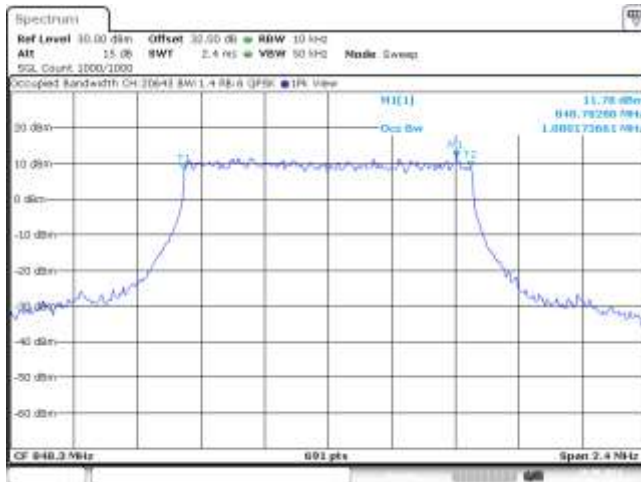
DATA: 13\_Anti\_0313\_16x1114

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



DATA: 13\_Anti\_0313\_16x1632

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

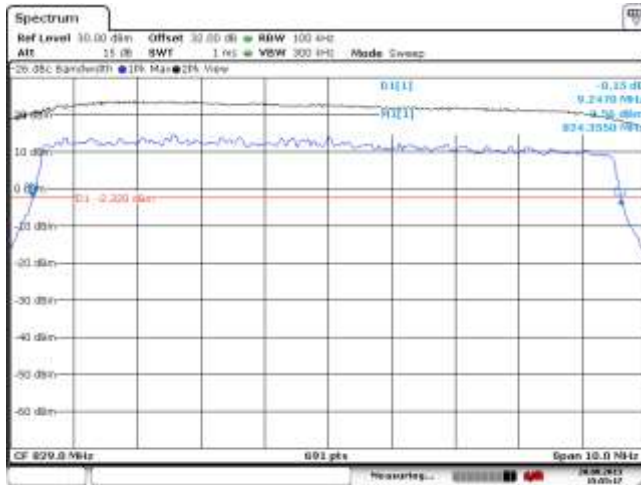


DATA: 13\_Anti\_0313\_16x1631

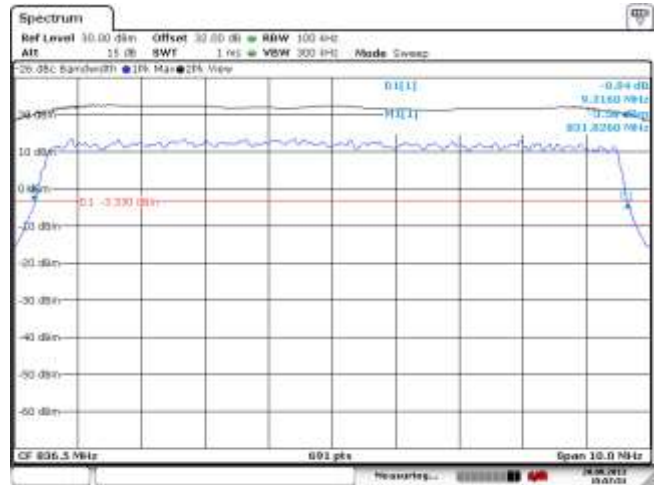
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

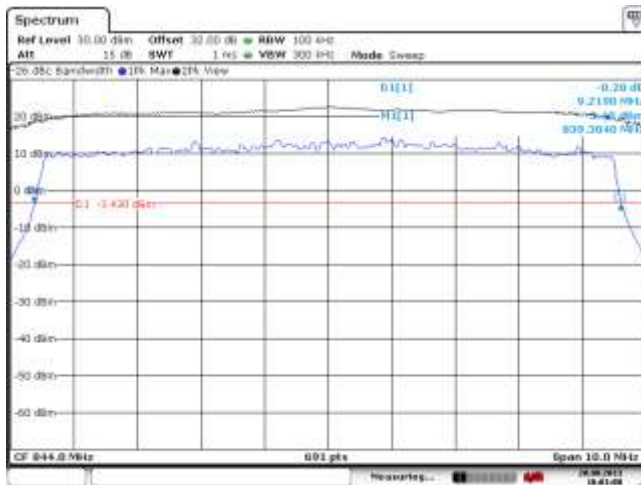
**Figure 4-28a: -26 dBc Bandwidth, Band 5 Low Channel, 10MHz BW, RB=50**



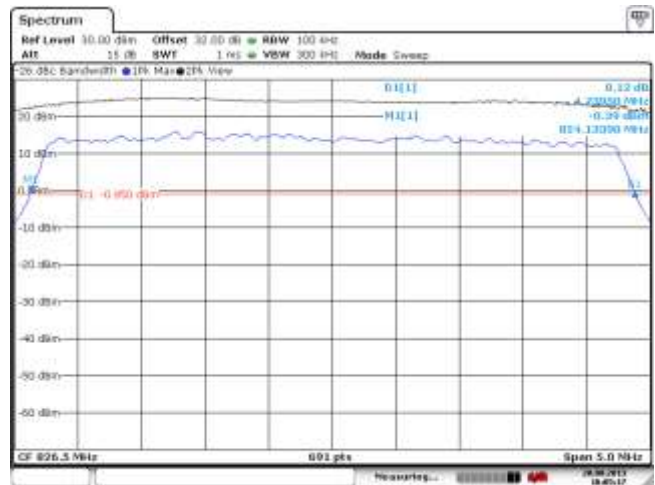
**Figure 4-29a: -26 dBc Bandwidth, Band 5 Middle Channel, 10MHz BW, RB=50**



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



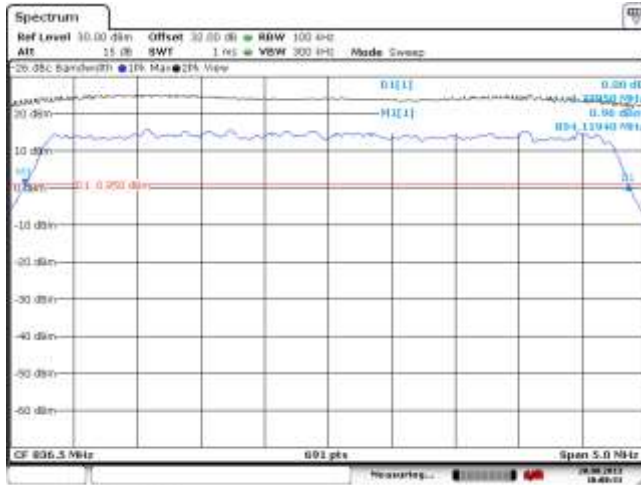
**Figure 4-31a: -26 dBc Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

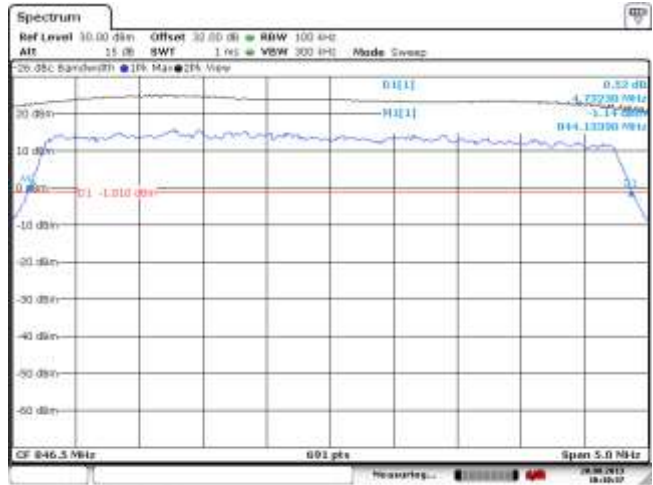
LTE Band 5 Conducted RF Emission Test Data cont'd

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



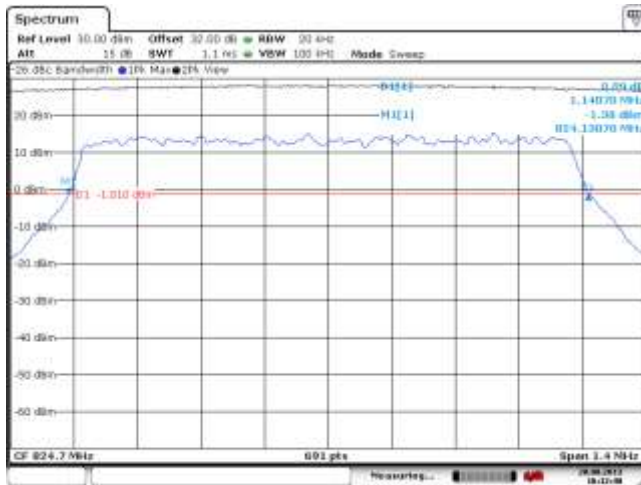
DATA: 25\_AUG\_2013 16:00:13

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



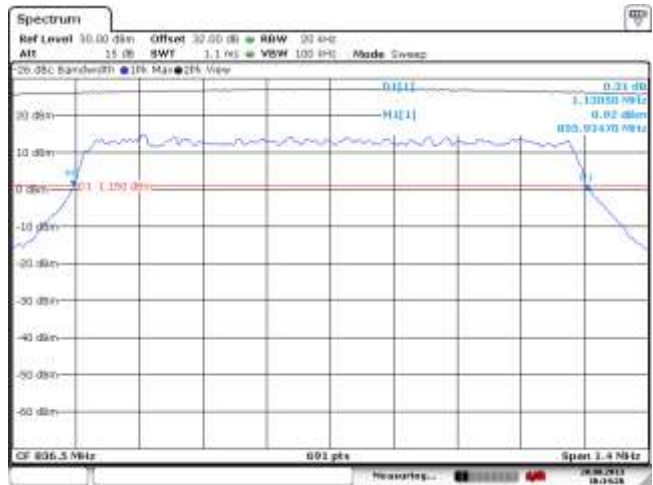
DATA: 25\_AUG\_2013 16:10:17

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



DATA: 25\_AUG\_2013 16:10:41

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

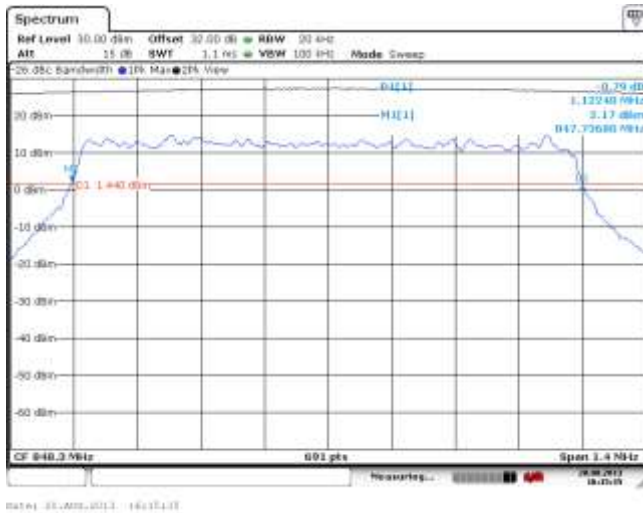


DATA: 25\_AUG\_2013 16:11:26

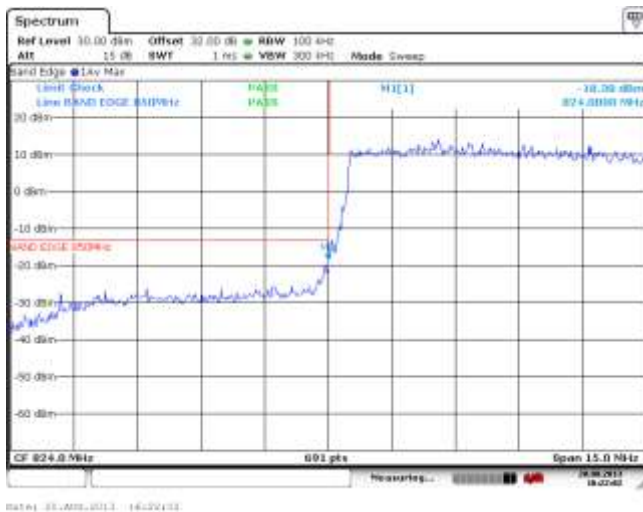
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

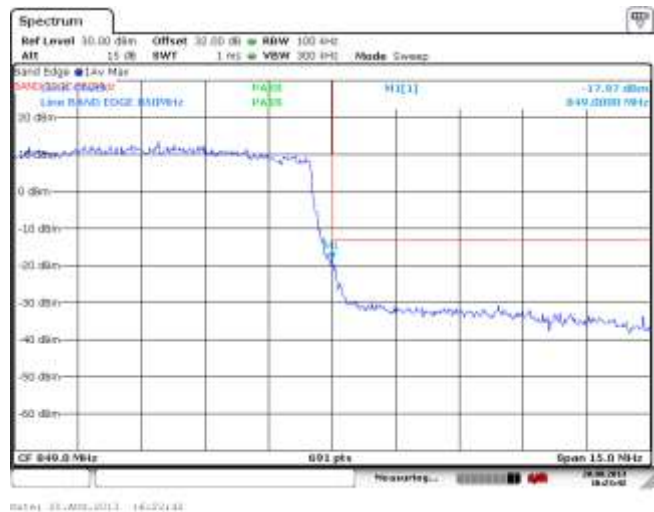
**Figure 4-36a: -26 dBc Bandwidth, Band 5 High Channel, 1.4MHz BW, RB=6**



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



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

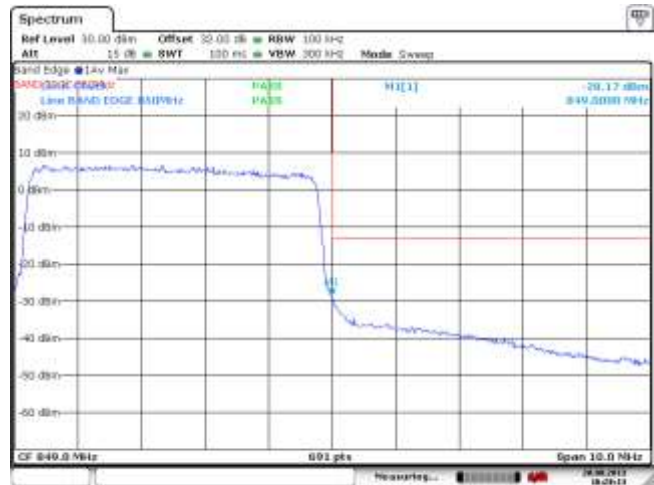
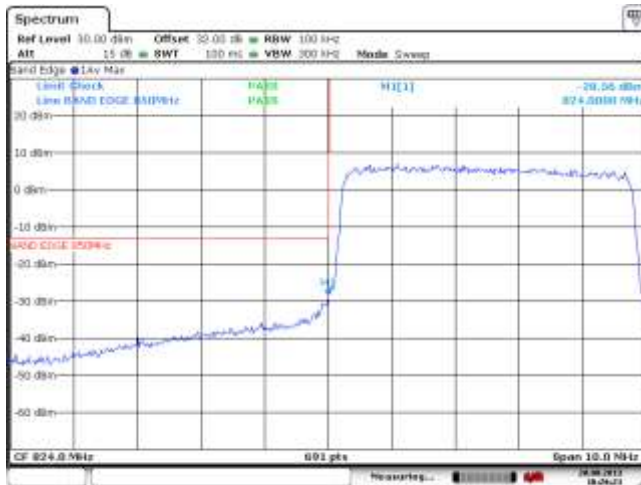


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

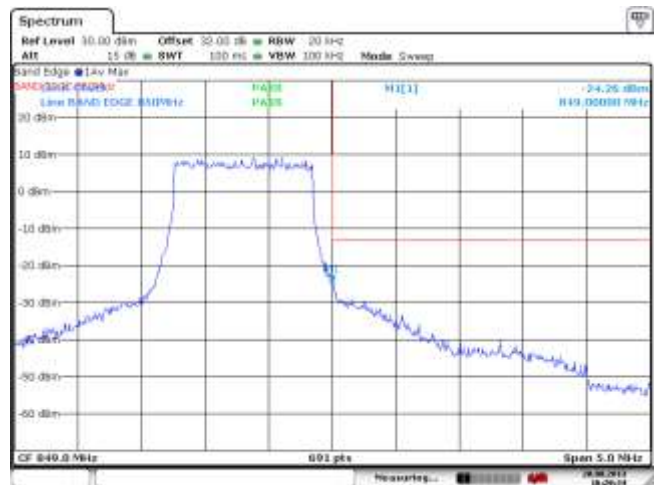
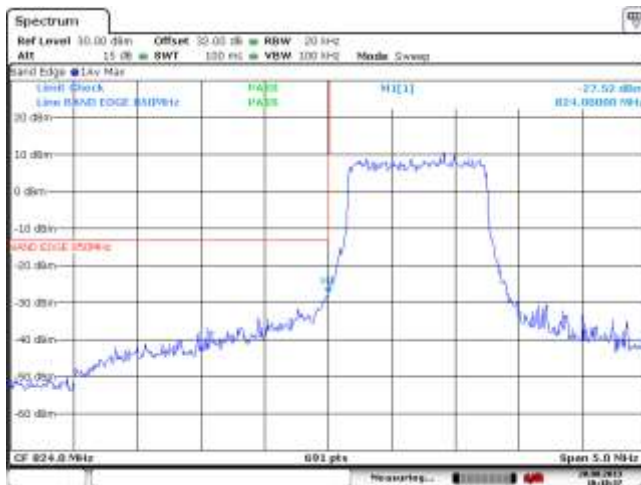
**Figure 4-39a: Band 5 Low Channel Mask, 5MHz BW, RB=25**

**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**



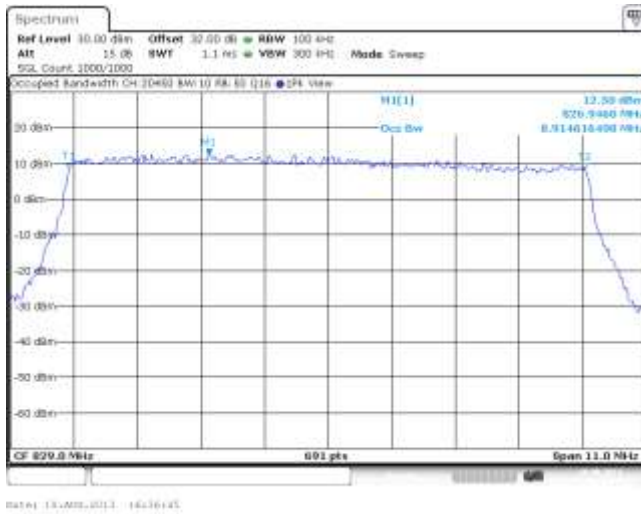




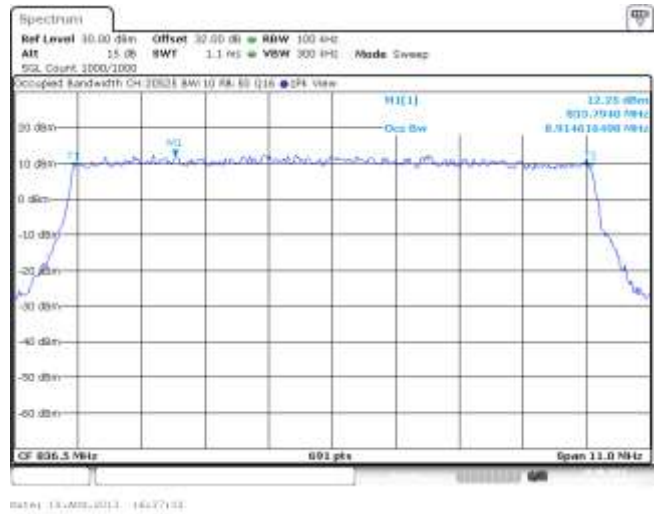
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

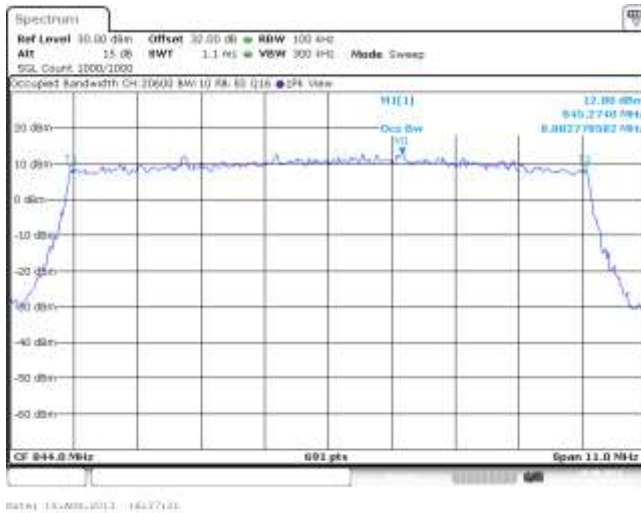
**Figure 3-45a: Occupied Bandwidth, Band 5 Low Channel, 10MHz BW (RB= 50) 16-QAM**



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



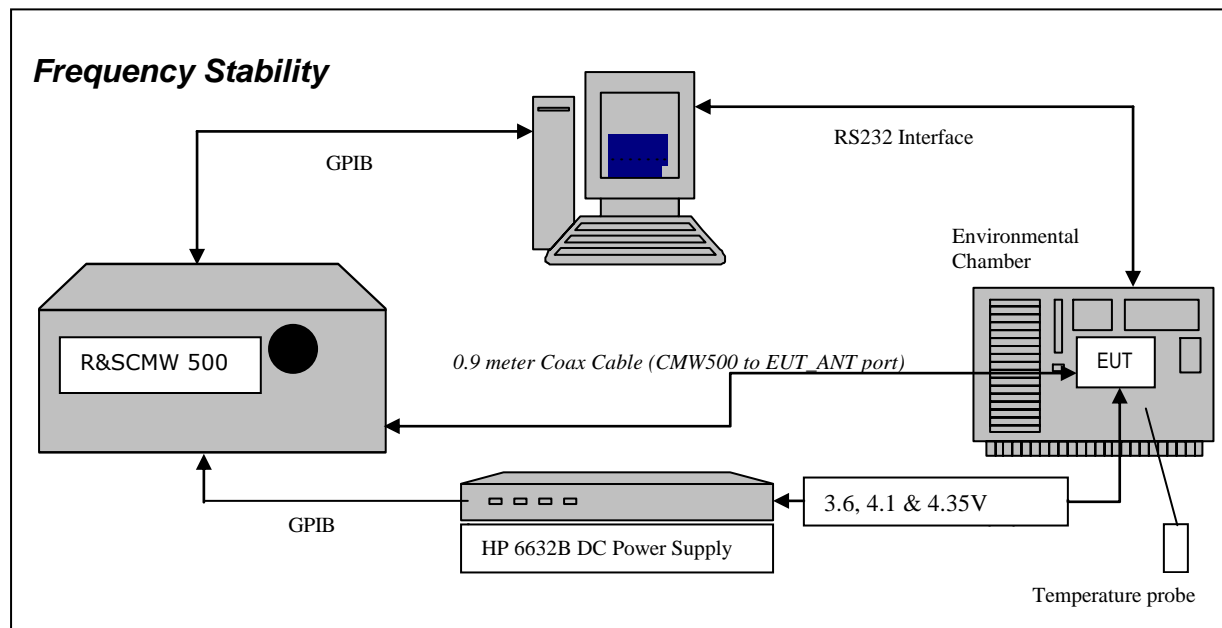
**Figure 3-47a: Occupied Bandwidth, Band 5 High Channel, 10MHz BW (RB= 50) 16-QAM**



## APPENDIX 4B – LTE Band 5 FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 5 Frequency Stability Test Data



The following measurements were performed by Chuan Tran.

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 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

Procedure:

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

15. Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
16. Start test program
17. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
18. Set power supply voltage to 3.6 volts.
19. Set up CMW 500 Radio Communication Tester.
20. Command the CMW 500 to switch to the low channel.
21. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
22. EUT is commanded to Transmit 100 Bursts.
23. 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.
24. The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
25. Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
26. Increase temperature by 10°C and soak for 1/2 hour.
27. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
28. 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 **0.0180PPM**.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following tests were performed on product RGF111LW.

Date of test: August 20, 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	-3.71	-0.0045
20525	836.5	3.6	20	-3.10	-0.0037
20600	844.0	3.6	20	2.95	0.0035

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	20	-3.29	-0.0040
20525	836.5	4.1	20	4.45	0.0053
20600	844.0	4.1	20	-3.79	-0.0045

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	20	-4.11	-0.0050
20525	836.5	4.35	20	5.11	0.0061
20600	844.0	4.35	20	-4.23	-0.0050

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-4.41	-0.0053
20450	829.0	3.6	-20	-3.85	-0.0046
20450	829.0	3.6	-10	4.18	0.0050
20450	829.0	3.6	0	-4.52	-0.0055
20450	829.0	3.6	10	-3.42	-0.0041
20450	829.0	3.6	20	-3.71	-0.0045
20450	829.0	3.6	30	-4.73	-0.0057
20450	829.0	3.6	40	-3.52	-0.0042
20450	829.0	3.6	50	-3.93	-0.0047
20450	829.0	3.6	60	6.90	0.0083
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	-30	-4.73	-0.0057
20450	829.0	4.1	-20	-3.96	-0.0048
20450	829.0	4.1	-10	-4.15	-0.0050
20450	829.0	4.1	0	-2.89	-0.0035
20450	829.0	4.1	10	3.36	0.0041
20450	829.0	4.1	20	-3.29	-0.0040
20450	829.0	4.1	30	-3.20	-0.0039
20450	829.0	4.1	40	-3.53	-0.0043
20450	829.0	4.1	50	3.06	0.0037
20450	829.0	4.1	60	-12.10	-0.0146
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	-30	-3.00	-0.0036
20450	829.0	4.35	-20	-4.12	-0.0050
20450	829.0	4.35	-10	-5.11	-0.0062
20450	829.0	4.35	0	2.63	0.0032
20450	829.0	4.35	10	-2.95	-0.0036
20450	829.0	4.35	20	-4.11	-0.0050
20450	829.0	4.35	30	-7.37	-0.0089
20450	829.0	4.35	40	-8.78	-0.0106
20450	829.0	4.35	50	-3.83	-0.0046
20450	829.0	4.35	60	-7.38	-0.0089



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	2.76	0.0033
20525	836.5	3.6	-20	4.23	0.0051
20525	836.5	3.6	-10	5.58	0.0067
20525	836.5	3.6	0	-2.40	-0.0029
20525	836.5	3.6	10	-2.27	-0.0027
20525	836.5	3.6	20	-3.10	-0.0037
20525	836.5	3.6	30	3.72	0.0044
20525	836.5	3.6	40	<b>15.06</b>	<b>0.0180</b>
20525	836.5	3.6	50	1.89	0.0023
20525	836.5	3.6	60	1.96	0.0023
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.1	-30	5.26	0.0063
20525	836.5	4.1	-20	5.66	0.0068
20525	836.5	4.1	-10	5.49	0.0066
20525	836.5	4.1	0	7.31	0.0087
20525	836.5	4.1	10	3.78	0.0045
20525	836.5	4.1	20	4.45	0.0053
20525	836.5	4.1	30	4.25	0.0051
20525	836.5	4.1	40	5.31	0.0063
20525	836.5	4.1	50	4.08	0.0049
20525	836.5	4.1	60	4.03	0.0048
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.35	-30	4.42	0.0053
20525	836.5	4.35	-20	3.85	0.0046
20525	836.5	4.35	-10	4.12	0.0049
20525	836.5	4.35	0	-3.02	-0.0036
20525	836.5	4.35	10	3.88	0.0046
20525	836.5	4.35	20	5.11	0.0061
20525	836.5	4.35	30	2.89	0.0035
20525	836.5	4.35	40	3.20	0.0038
20525	836.5	4.35	50	4.81	0.0058
20525	836.5	4.35	60	3.66	0.0044

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 4B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	4.71	0.0056
20600	844.0	3.6	-20	-2.72	-0.0032
20600	844.0	3.6	-10	-4.82	-0.0057
20600	844.0	3.6	0	-3.35	-0.0040
20600	844.0	3.6	10	3.45	0.0041
20600	844.0	3.6	20	2.95	0.0035
20600	844.0	3.6	30	-3.96	-0.0047
20600	844.0	3.6	40	-3.81	-0.0045
20600	844.0	3.6	50	-3.18	-0.0038
20600	844.0	3.6	60	-3.30	-0.0039
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.1	-30	3.39	0.0040
20600	844.0	4.1	-20	4.52	0.0054
20600	844.0	4.1	-10	-3.45	-0.0041
20600	844.0	4.1	0	3.82	0.0045
20600	844.0	4.1	10	-3.50	-0.0041
20600	844.0	4.1	20	-3.79	-0.0045
20600	844.0	4.1	30	-4.18	-0.0050
20600	844.0	4.1	40	-3.47	-0.0041
20600	844.0	4.1	50	-3.68	-0.0044
20600	844.0	4.1	60	-3.23	-0.0038
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.35	-30	-4.62	-0.0055
20600	844.0	4.35	-20	-3.72	-0.0044
20600	844.0	4.35	-10	-3.52	-0.0042
20600	844.0	4.35	0	5.21	0.0062
20600	844.0	4.35	10	-3.60	-0.0043
20600	844.0	4.35	20	-4.23	-0.0050
20600	844.0	4.35	30	4.56	0.0054
20600	844.0	4.35	40	-3.60	-0.0043
20600	844.0	4.35	50	2.92	0.0035
20600	844.0	4.35	60	-7.55	-0.0089

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



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 4 Conducted RF Emission Test Data cont'd

The following tests were performed on product RGF111LW.

#### Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Emission Designator	Band	Bandwidth (MHz)	Modulation
1710.7-1754.3	23.75	1M08G7D	LTE B4	1.4	QPSK
1710.7-1754.3	22.55	1M08D7W	LTE B4	1.4	16QAM
1711.5-1753.5	23.80	2M69G7D	LTE B4	3	QPSK
1711.5-1753.5	22.55	2M69D7W	LTE B4	3	16QAM
1712.5-1752.5	23.85	4M48G7D	LTE B4	5	QPSK
1712.5-1752.5	23.05	4M47D7W	LTE B4	5	16QAM
1715-1750	23.71	8M95G7D	LTE B4	10	QPSK
1715-1750	22.49	8M95D7W	LTE B4	10	16QAM
1717.5-1747.5	23.67	13M4G7D	LTE B4	15	QPSK
1717.5-1747.5	22.63	13M4D7W	LTE B4	15	16QAM
1720-1745	23.83	17M9G7D	LTE B4	20	QPSK
1720-1745	22.30	17M9D7W	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 18.62 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	18.58	<b>17.87</b>	<b>17.87</b>
1732.5	18.62	<b>17.87</b>	17.81
1745.0	18.70	<b>17.87</b>	<b>17.87</b>

**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 9.24 dB in 10MHz 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.

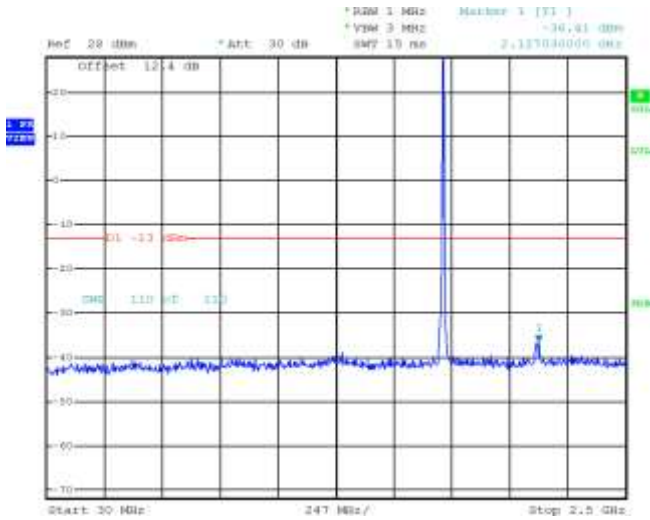
See Figures 5-35a to 5-44a for the plots of the Channel mask.

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

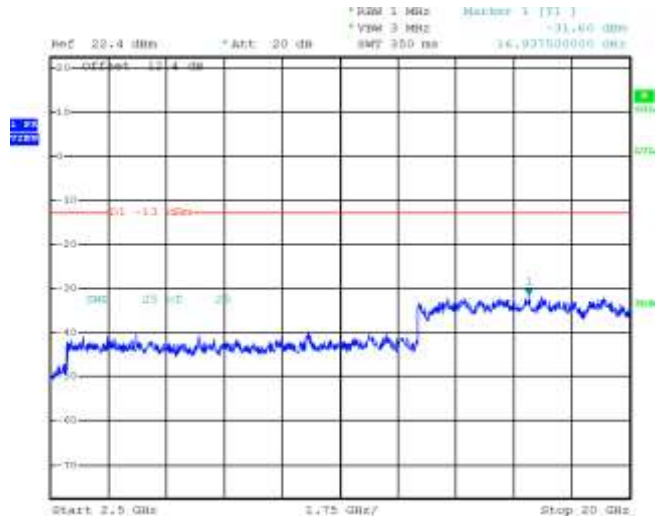
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

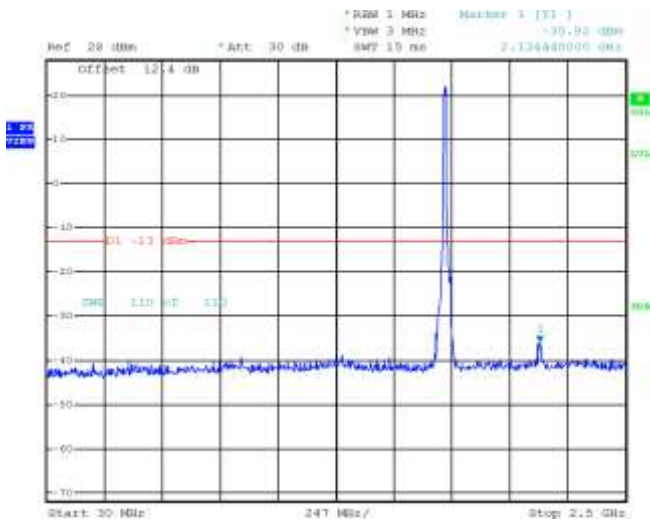
**Figure 5-1a: Band 4, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 1)**



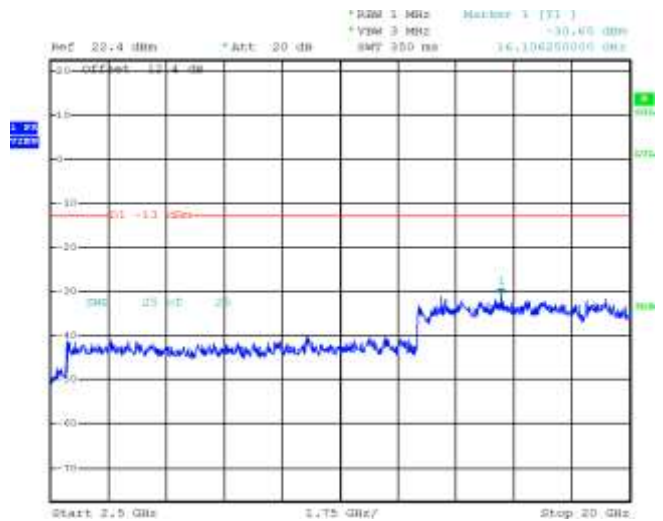
**Figure 5-2a: Band 4, Spurious Conducted Emissions, Low channel, 20MHz BW (RB= 1)**



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



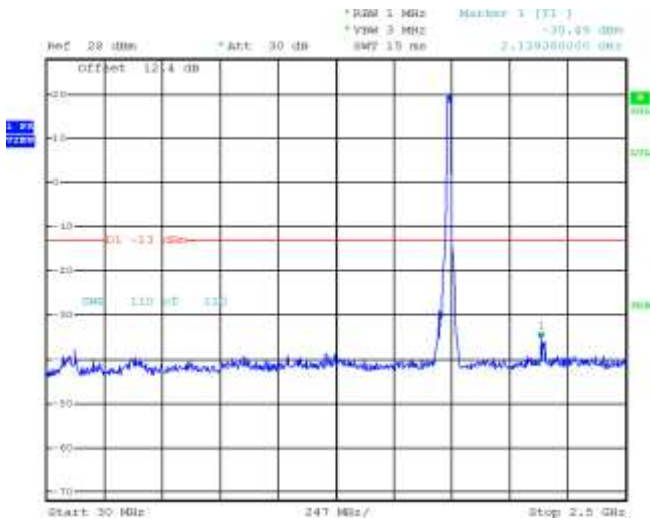
**Figure 5-4a: Band 4, Spurious Conducted Emissions, Middle channel, 20MHz BW (RB= 50)**



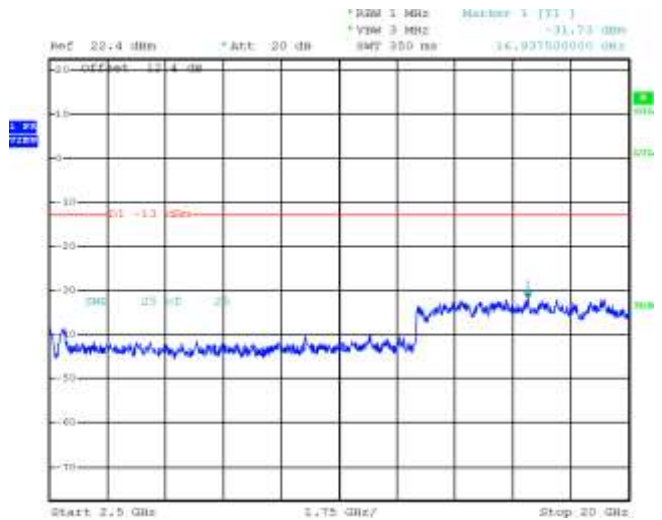
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

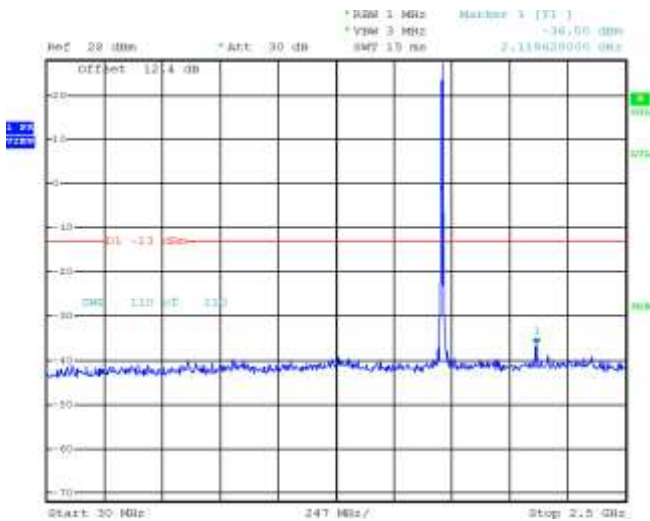
**Figure 5-5a: Band 4, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)**



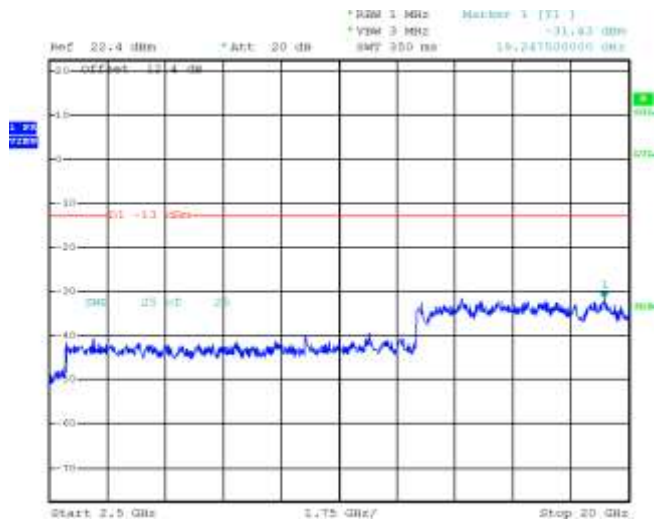
**Figure 5-6a: Band 4, Spurious Conducted Emissions, High Channel, 20MHz BW (RB= 100)**



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



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

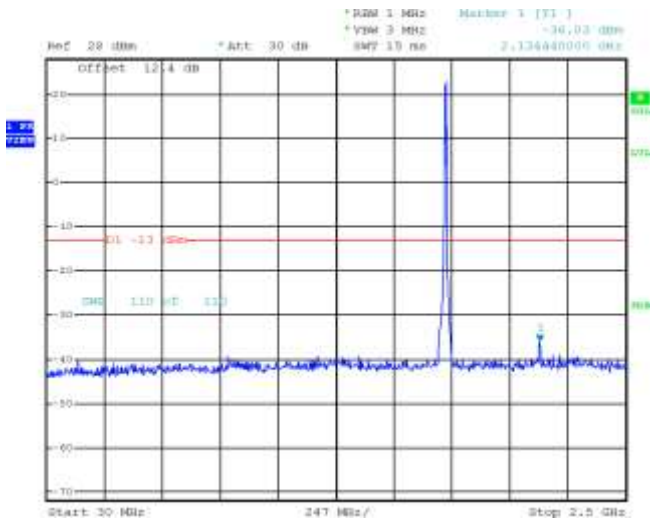




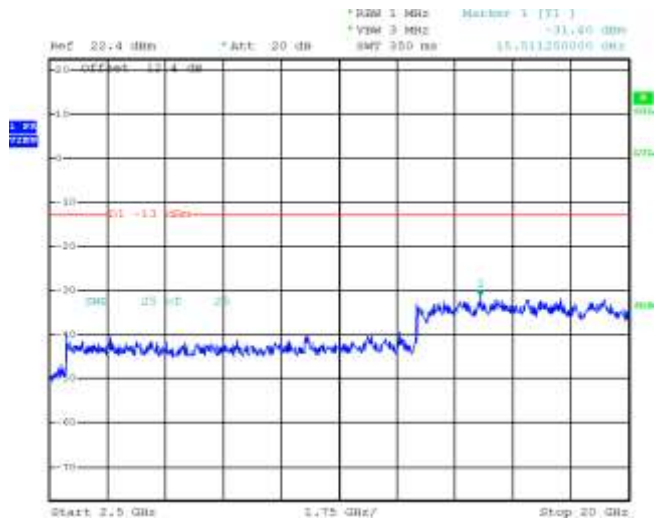
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

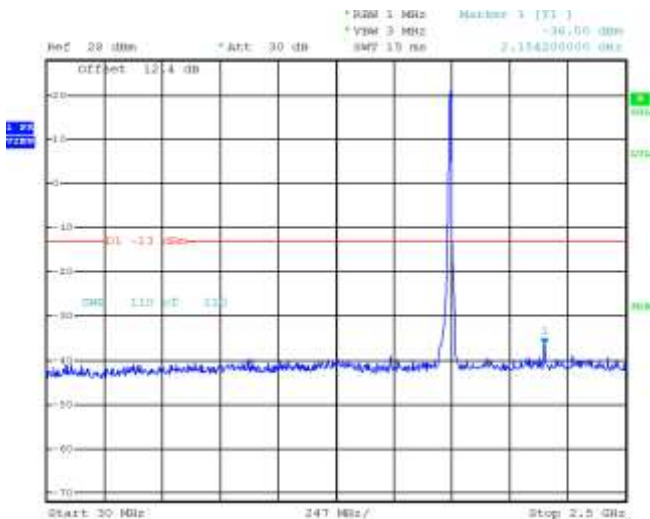
**Figure 5-9a: Band 4, Spurious Conducted Emissions, Middle Channel, 10MHz BW (RB= 25)**



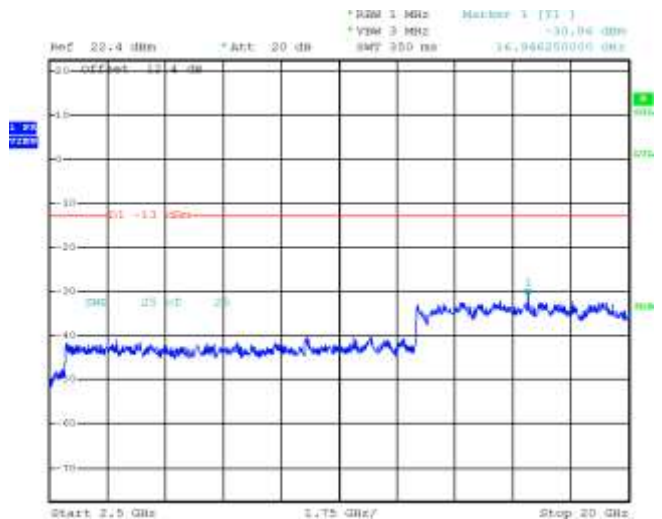
**Figure 5-10a: Band 4, Spurious Conducted Emissions, Middle Channel, 10MHz BW (RB= 25)**



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



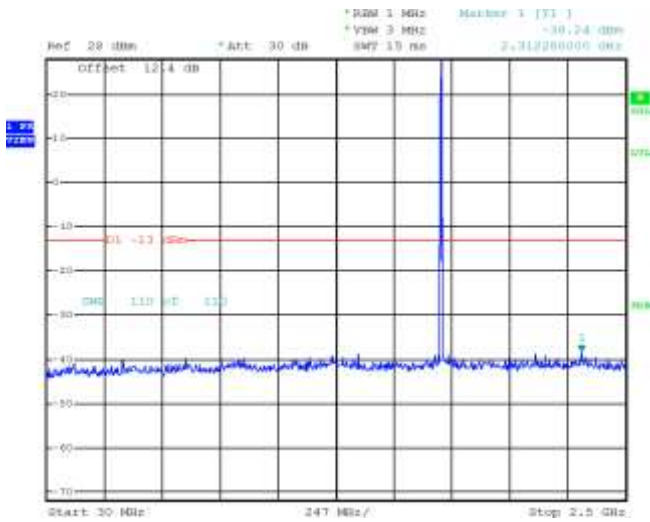
**Figure 5-12a: Band 4, Spurious Conducted Emissions, High channel, 10MHz BW (RB= 50)**



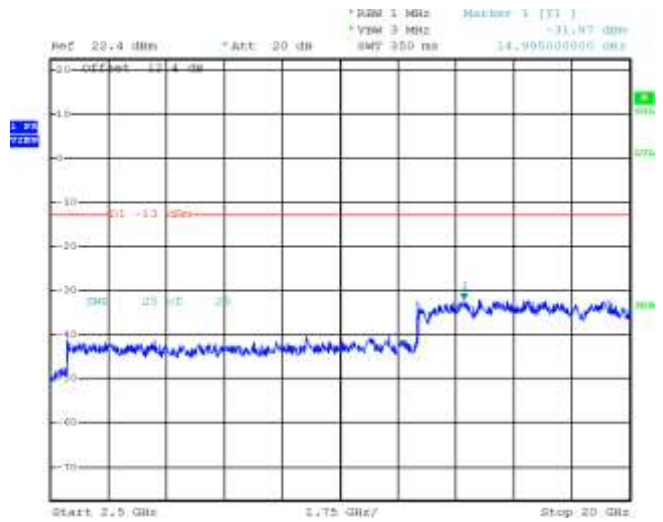
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

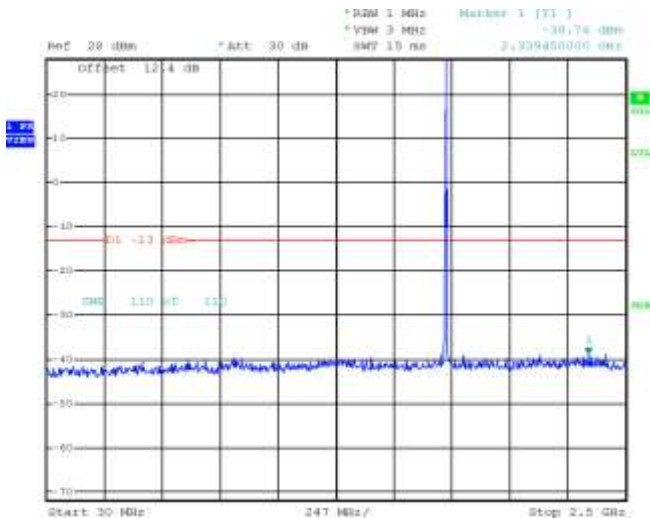
**Figure 5-13a: Band 4, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)**



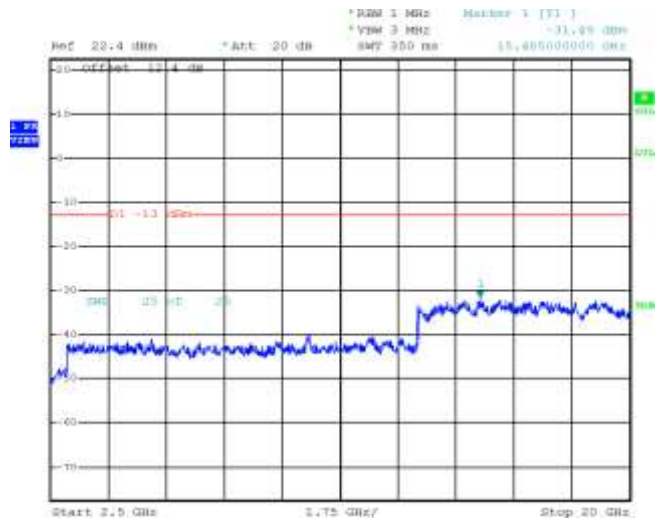
**Figure 5-14a: Band 4, Spurious Conducted Emissions, Low Channel, 1.4MHz BW (RB= 1)**



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



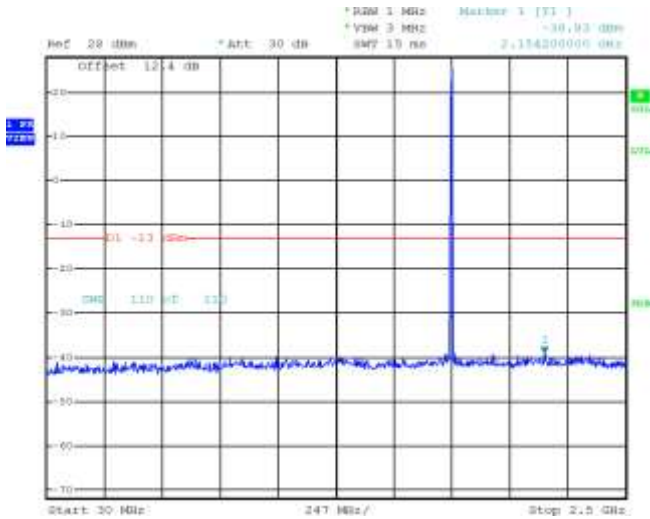
**Figure 5-16a: Band 4, Spurious Conducted Emissions, Middle channel, 1.4MHz BW (RB= 3)**



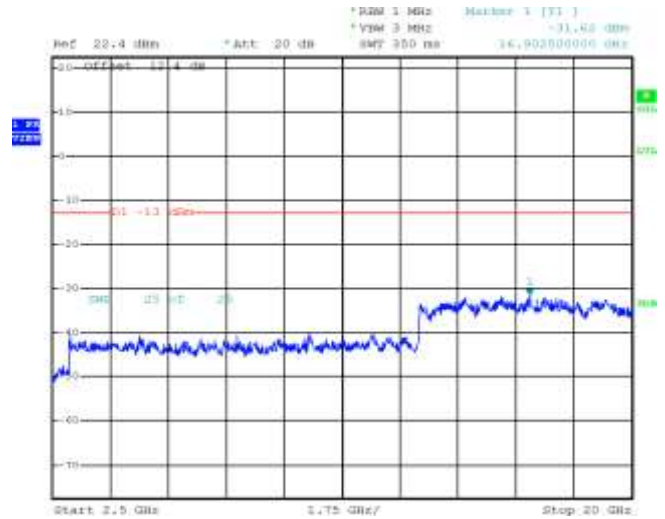
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

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)**



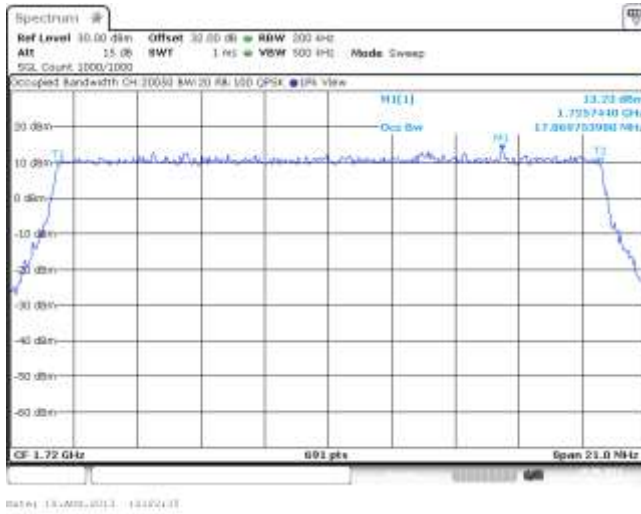
**Figure 5-18a: Band 4, Spurious Conducted Emissions, High channel, 1.4MHz BW (RB= 6)**



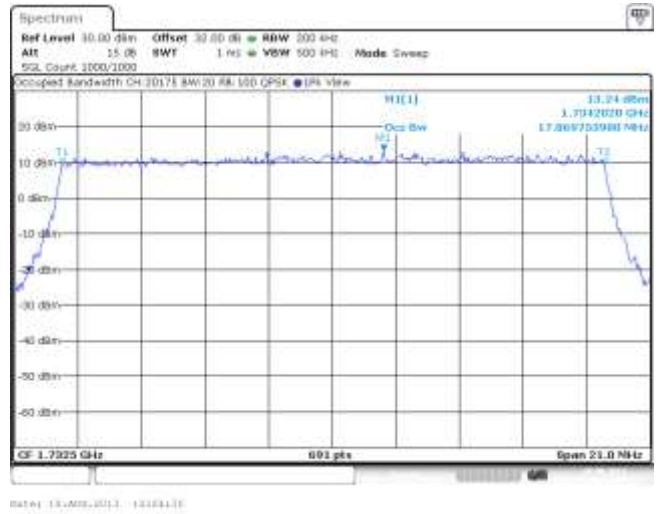
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

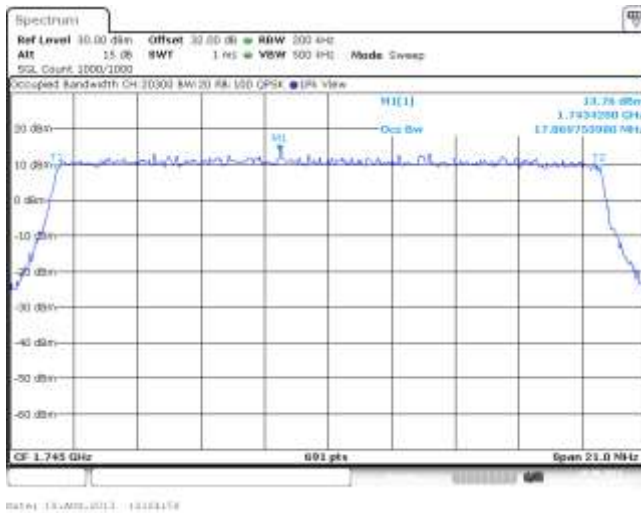
**Figure 5-19a: Occupied Bandwidth, Band 4 Low Channel, 20MHz BW, RB=100**



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



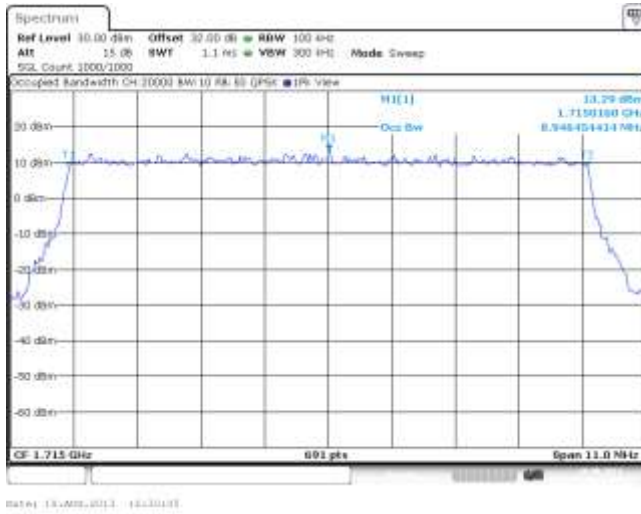
**Figure 5-21a: Occupied Bandwidth, Band 4 High Channel, 20MHz BW, RB=100**



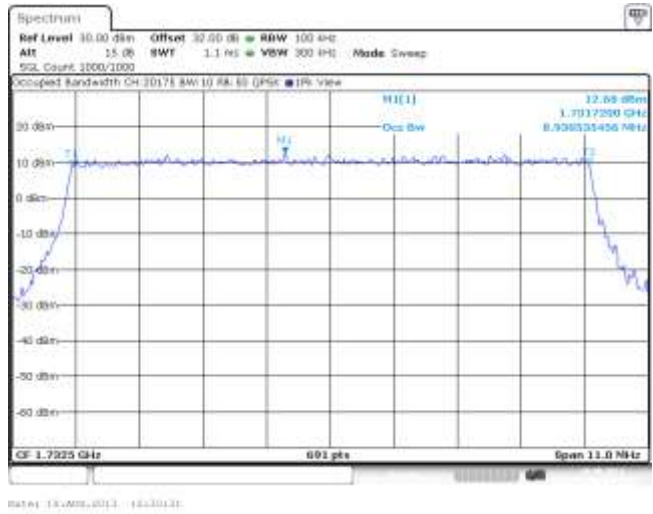
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

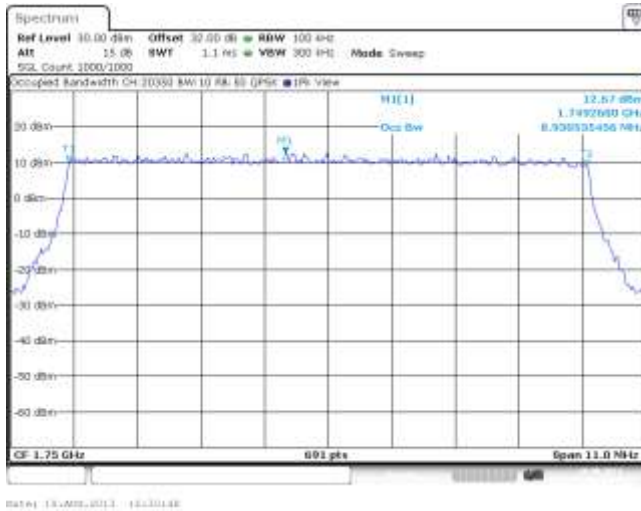
**Figure 5-22a: Occupied Bandwidth, Band 4 Low Channel, 10MHz BW, RB=50**



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



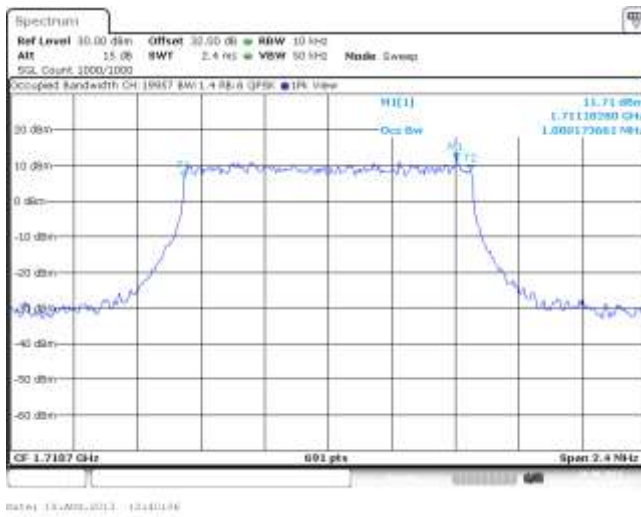
**Figure 5-24a: Occupied Bandwidth, Band 4 High Channel, 10MHz BW, RB=50**



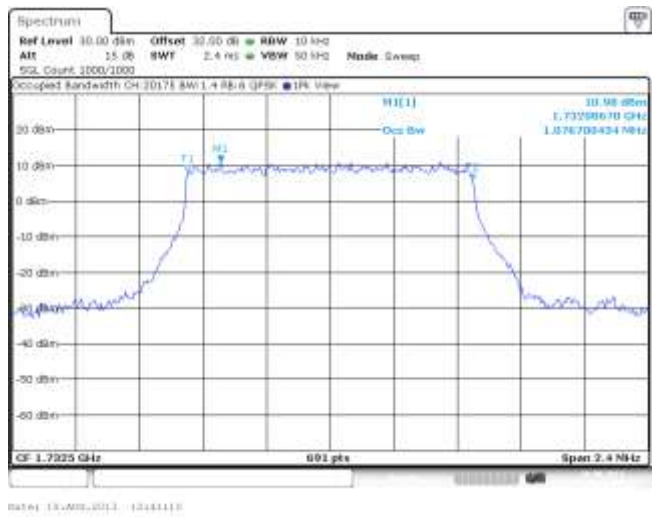
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

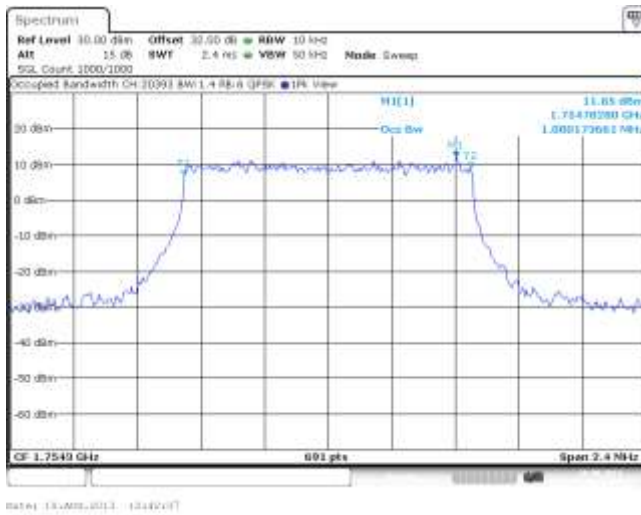
**Figure 5-25a: Occupied Bandwidth, Band 4 Low Channel, 1.4MHz BW, RB=6**



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



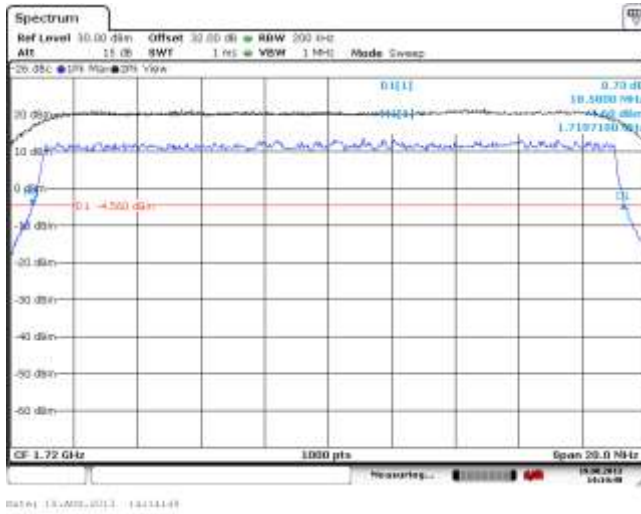
**Figure 5-27a: Occupied Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6**



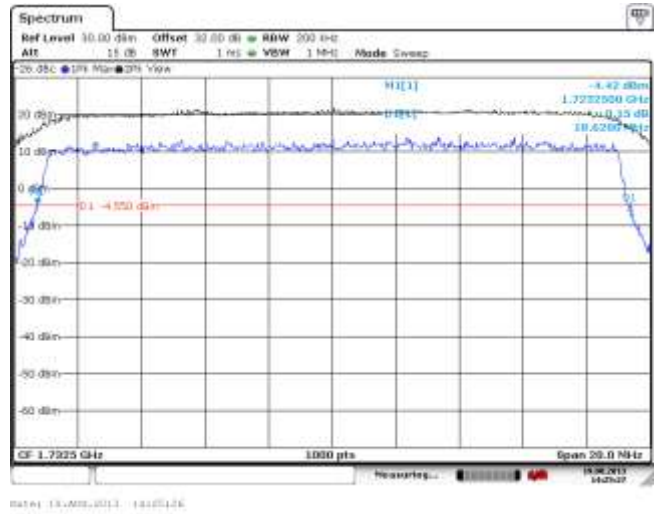
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

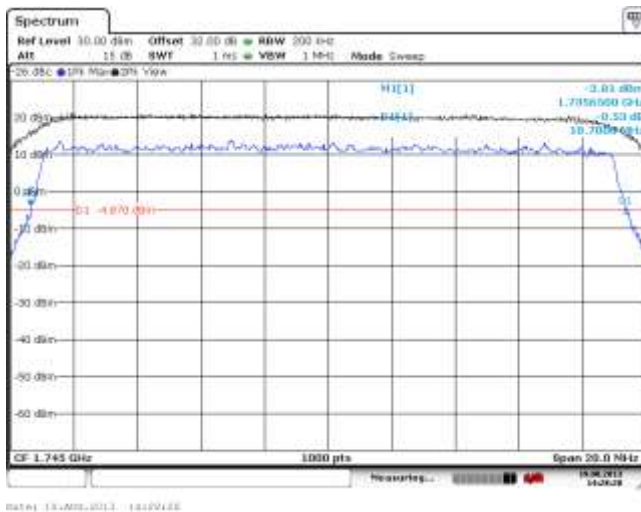
**Figure 5-28a: -26 dBc Bandwidth, Band 4 Low Channel, 20MHz BW, RB=100**



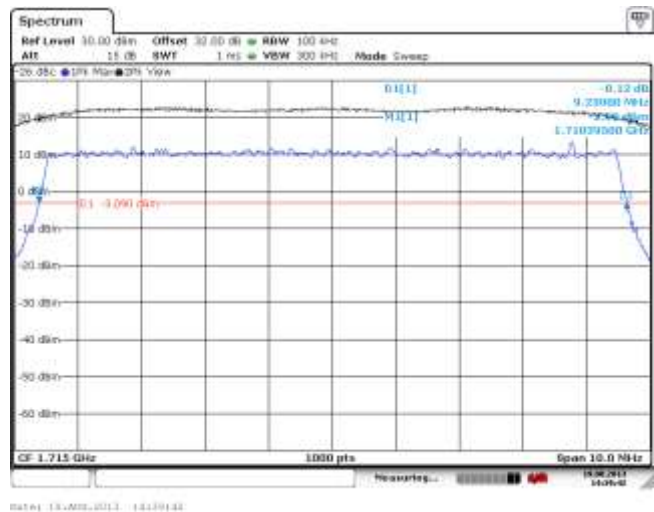
**Figure 5-29a: -26 dBc Bandwidth, Band 4 Middle Channel, 20MHz BW, RB=100**



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



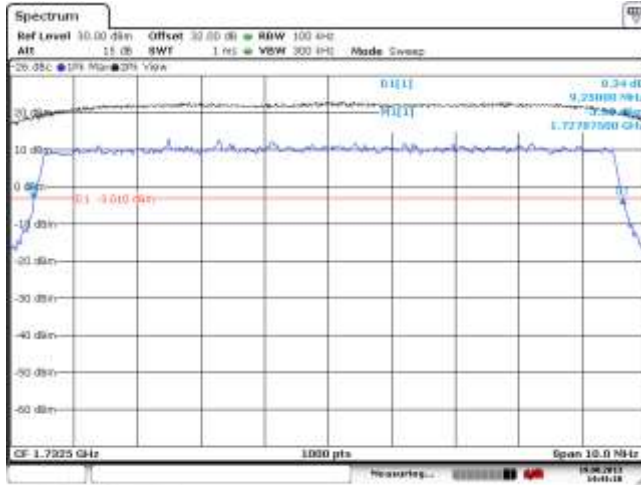
**Figure 5-31a: -26 dBc Bandwidth, Band 4 Low Channel, 10MHz BW, RB=50**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

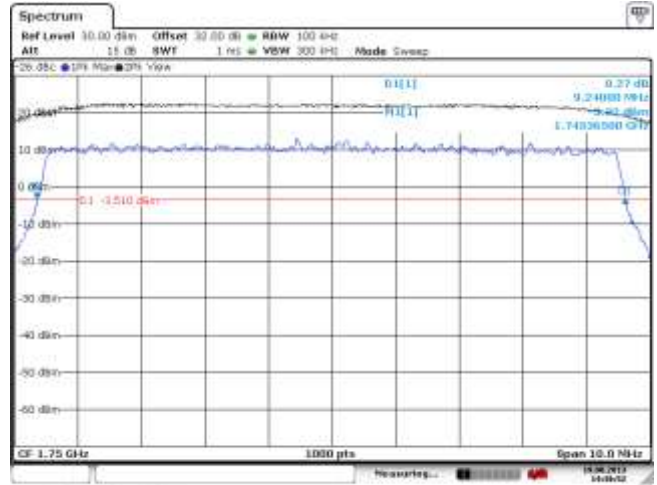
LTE Band 4 Conducted RF Emission Test Data cont'd

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



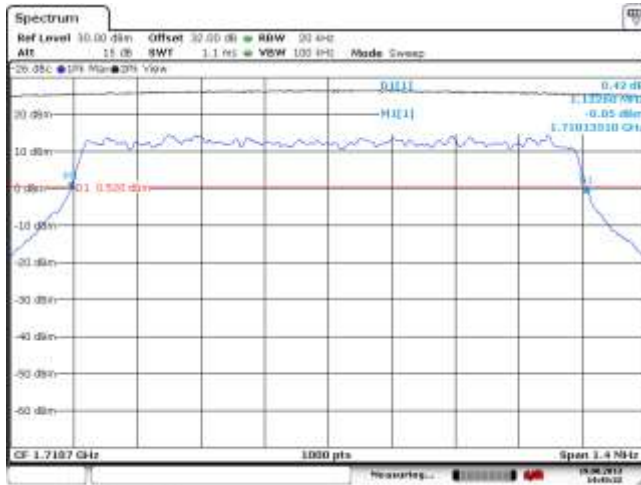
DATA: (S:ANS:0013: 1444311)

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



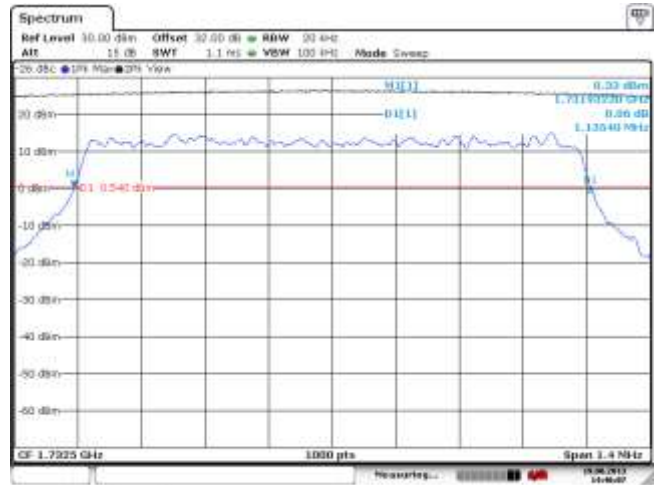
DATA: (S:ANS:0013: 1444313)

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



DATA: (S:ANS:0013: 1444314)

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



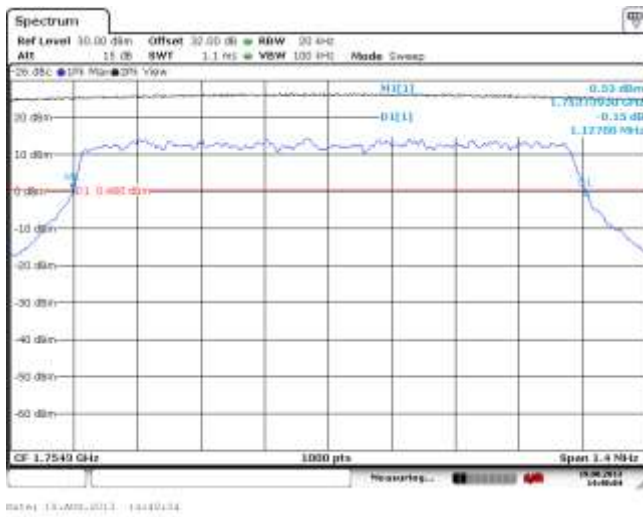
DATA: (S:ANS:0013: 1444315)



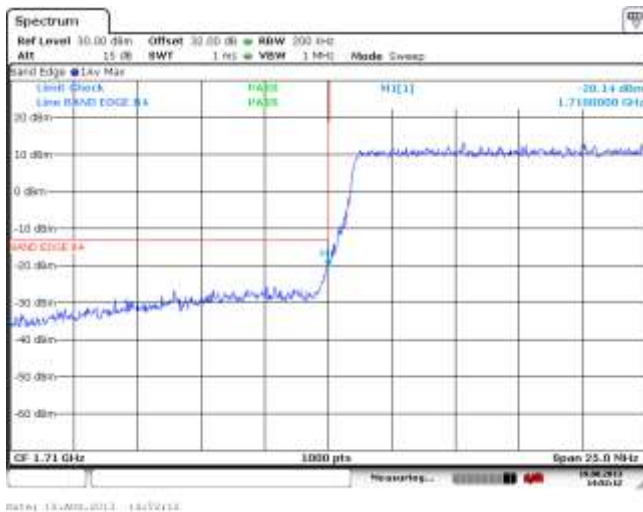
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

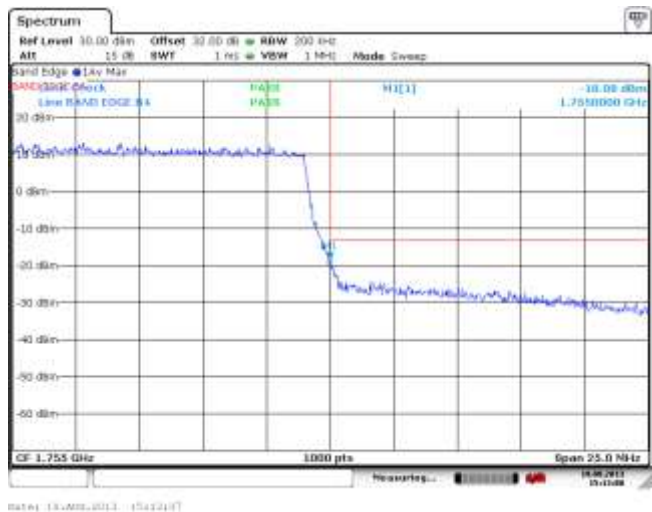
**Figure 5-36a: -26 dBc Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6**



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



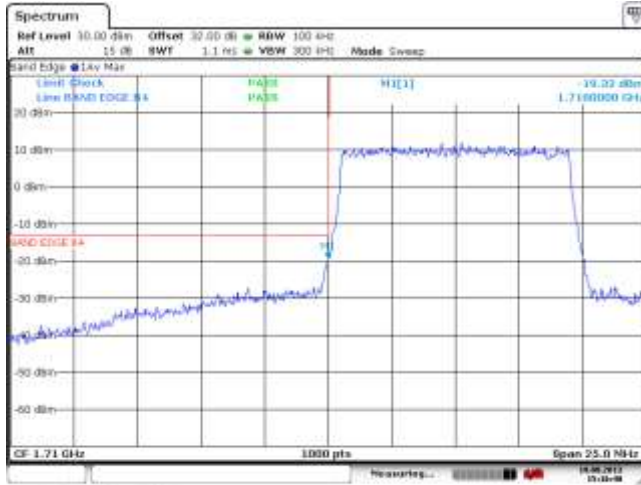
**Figure 5-38a: Band 4 High Channel Mask, 20MHz BW, RB=100**



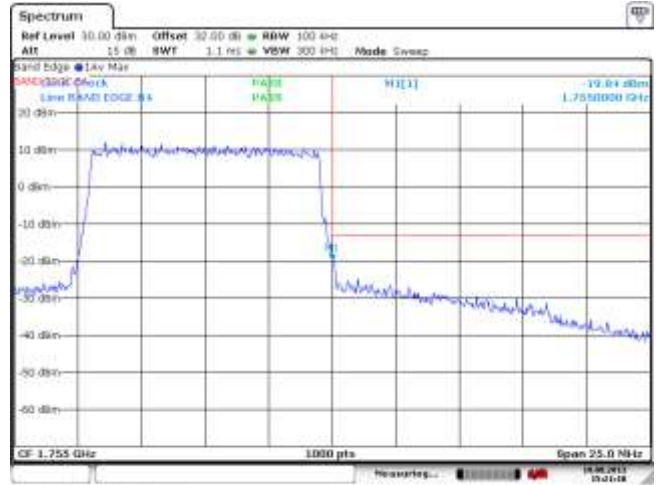
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

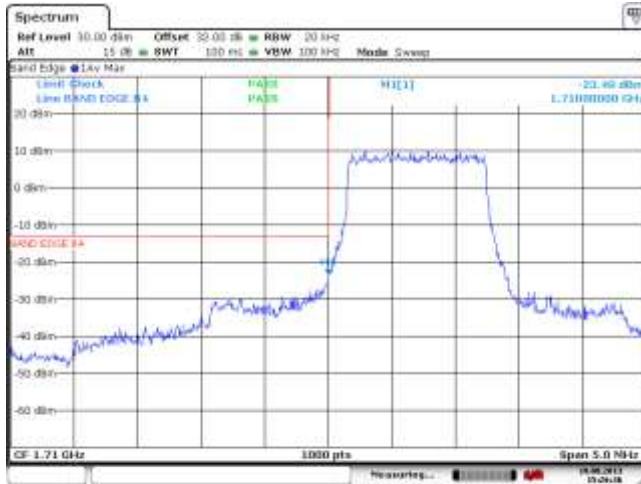
**Figure 5-39a: Band 4 Low Channel Mask, 10MHz BW, RB=50**



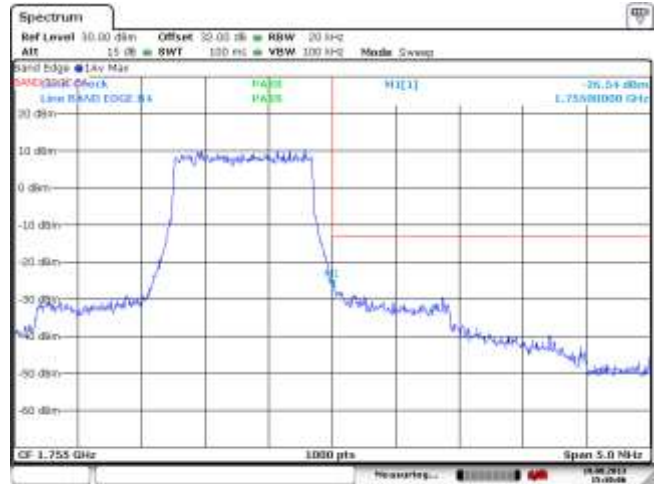
**Figure 5-40a: Band 4 High Channel Mask, 10MHz BW, RB=50**



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



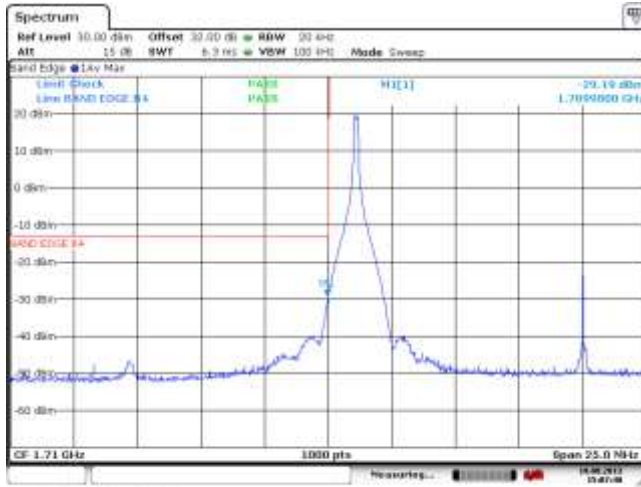
**Figure 5-42a: Band 4 High Channel Mask, 1.4MHz BW, RB=6**



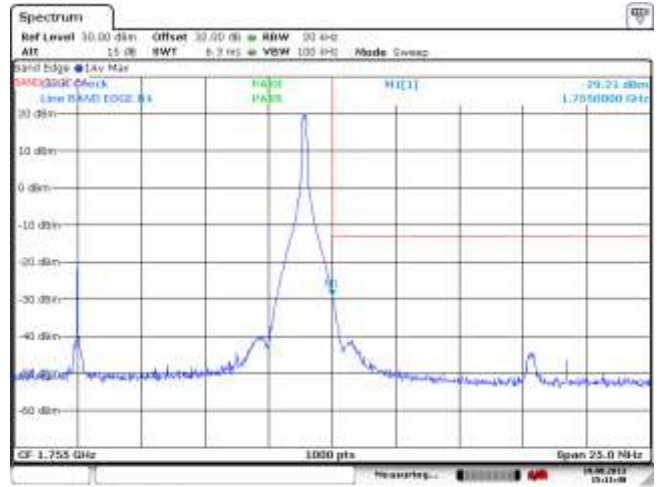
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

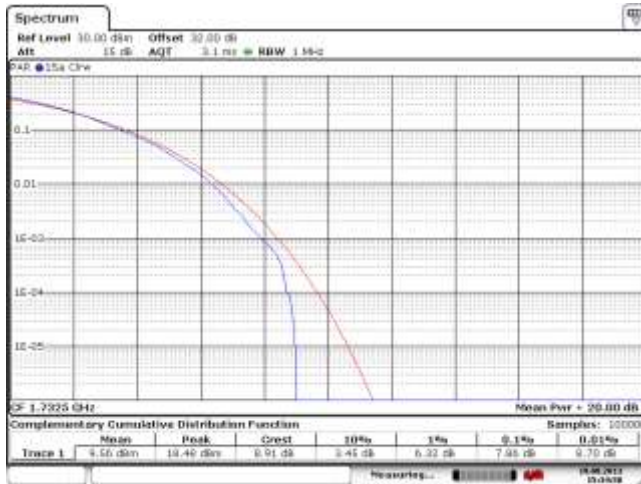
**Figure 5-43a: Band 4 Low Channel Mask, 20MHz BW, RB=1**



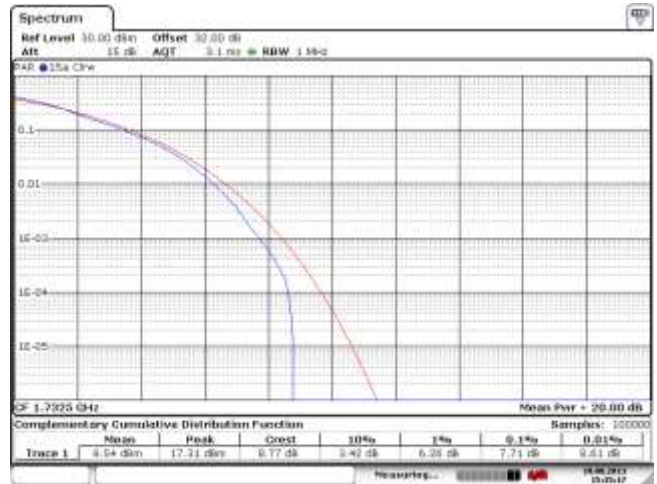
**Figure 5-44a: Band 4 High Channel Mask, 20MHz BW, RB=1**



**Figure 5-45a: Band 4 Mid Channel PAR, 20MHz BW, RB=50, QPSK**



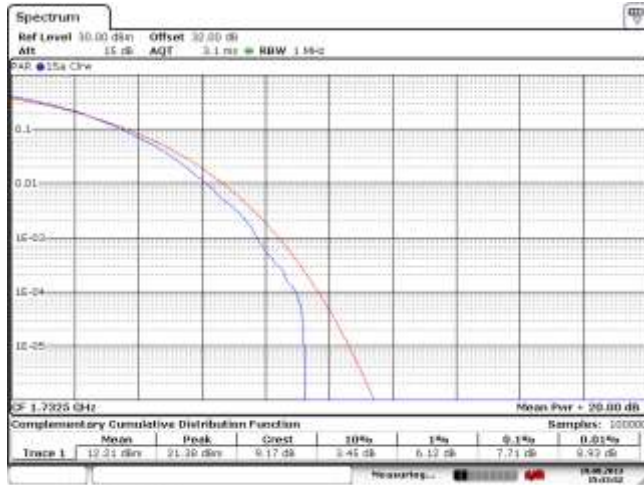
**Figure 5-46a: Band 4 Middle Channel Mask, 20MHz BW, RB=100, 16-QAM**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

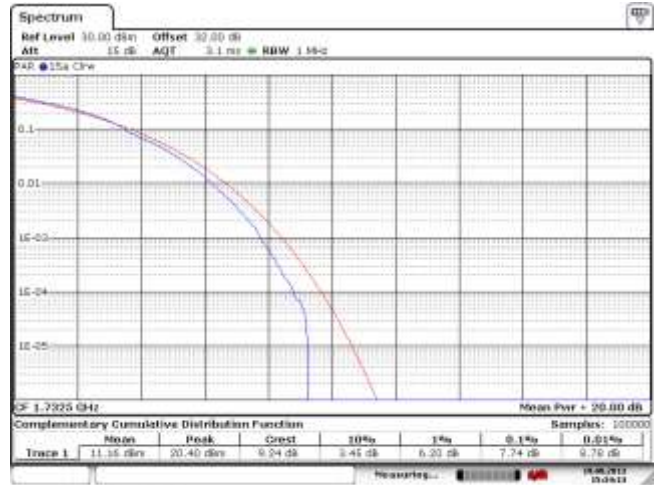
LTE Band 4 Conducted RF Emission Test Data cont'd

**Figure 5-47a: Band 4 Mid Channel PAR, 10MHz BW, RB=25, QPSK**



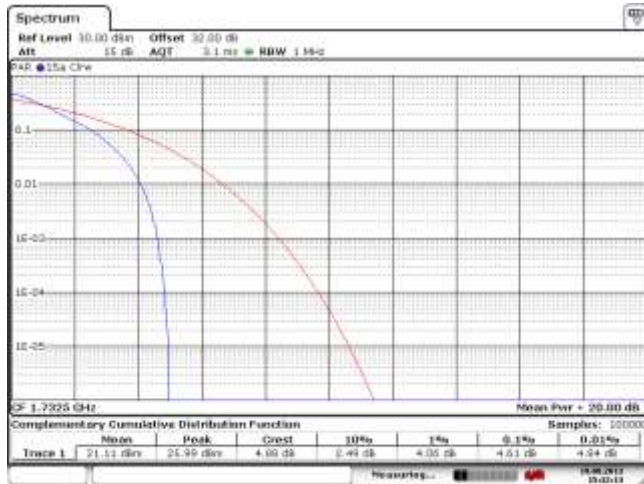
DATA: 13\_AUG\_2013 15:42:12

**Figure 5-48a: Band 4 Mid Channel PAR, 10MHz BW, RB=50, 16-QAM**



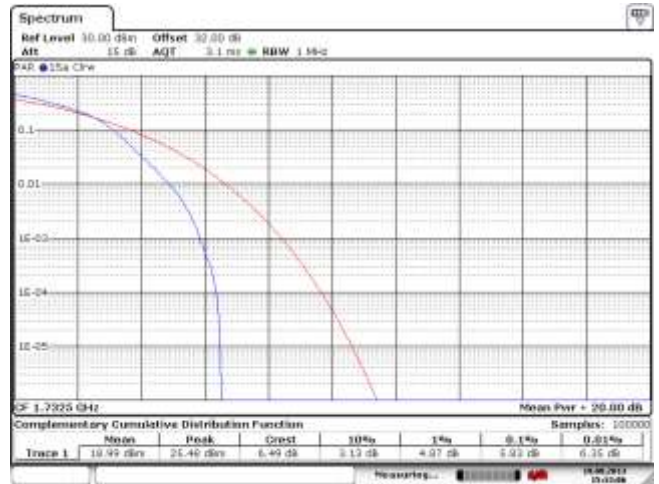
DATA: 13\_AUG\_2013 15:42:12

**Figure 5-49a: Band 4 Mid Channel PAR, 1.4MHz BW, RB=3, QPSK**



DATA: 13\_AUG\_2013 15:42:13

**Figure 5-50a: Band 4 Middle Channel Mask, 5MHz BW, RB=6, 16-QAM**

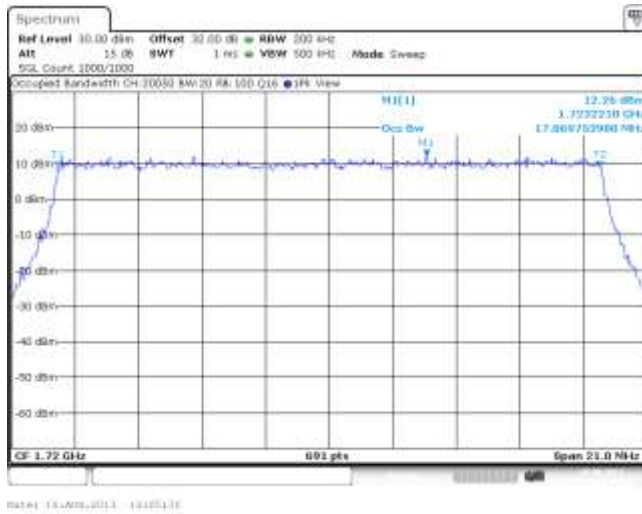


DATA: 13\_AUG\_2013 15:42:16

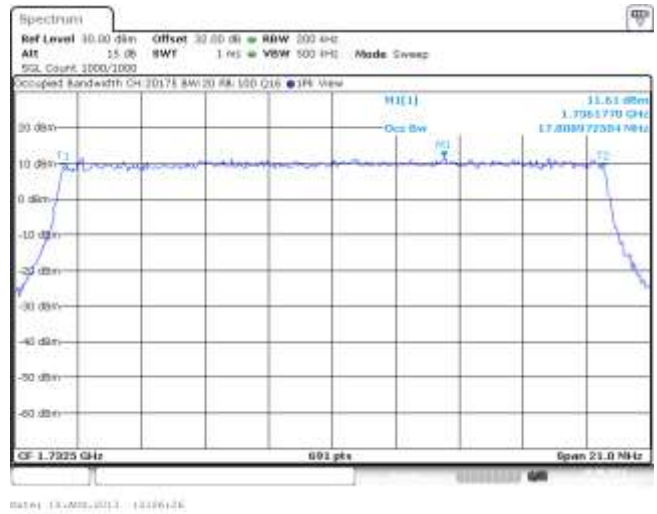
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

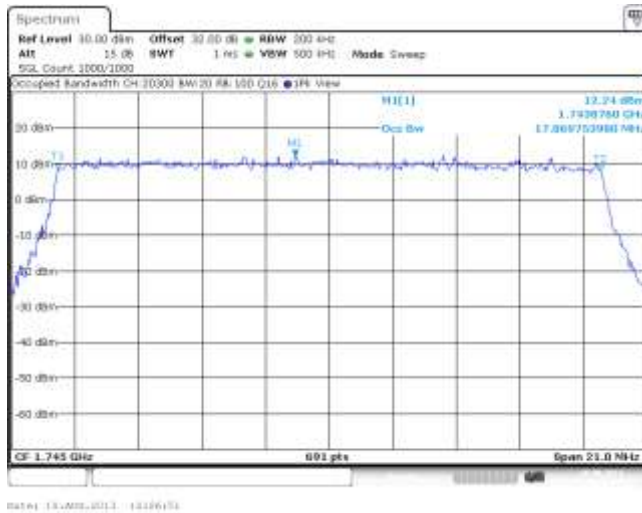
**Figure 5-51a: Occupied Bandwidth, Band 4 Low Channel, 20MHz BW (RB= 100) 16-QAM**



**Figure 5-52a: Occupied Bandwidth, Band 4 Mid Channel, 20MHz BW (RB= 100) 16-QAM**



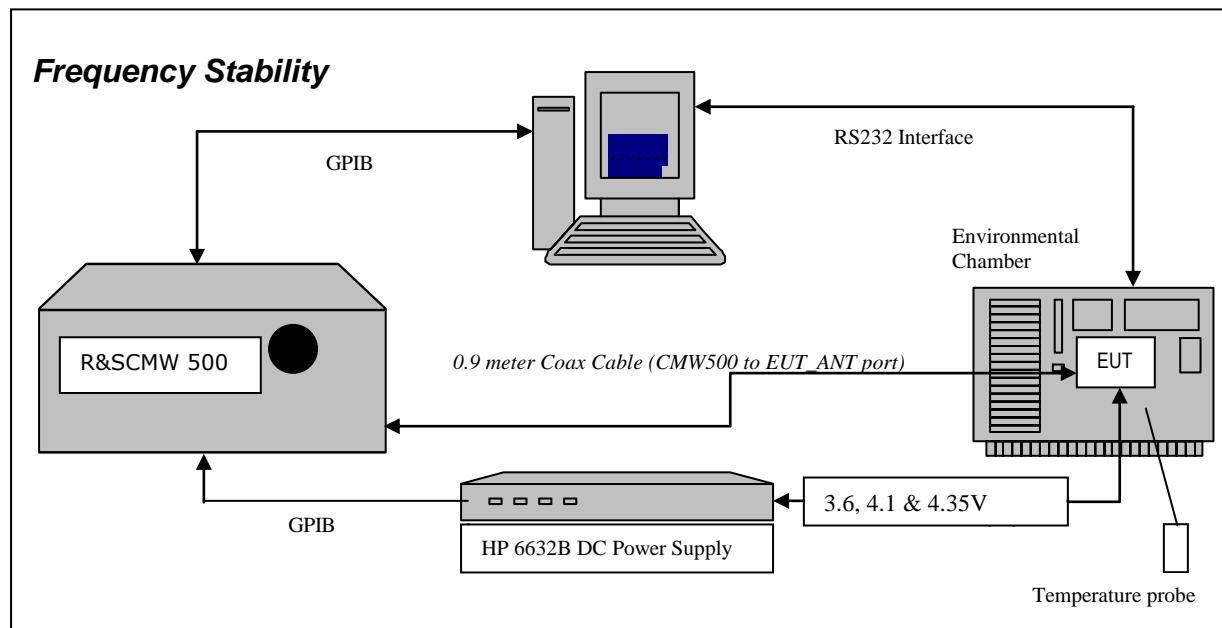
**Figure 5-53a: Occupied Bandwidth, Band 4 High Channel, 20MHz BW (RB= 100) 16-QAM**



## APPENDIX 5B – LTE Band 4 FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 4 Frequency Stability Test Data



The following measurements were performed by Chuan Tran.

#### **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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

## 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.



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

Procedure:

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

29. Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
30. Start test program
31. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
32. Set power supply voltage to 3.6 volts.
33. Set up CMW 500 Radio Communication Tester.
34. Command the CMW 500 to switch to the low channel.
35. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
36. EUT is commanded to Transmit 100 Bursts.
37. 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.
38. The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
39. Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
40. Increase temperature by 10°C and soak for 1/2 hour.
41. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
42. 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 **-0.0118PPM**.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following tests were performed on product RGF111LW.

Date of test: August 19, 2012

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	9.94	0.0058
20175	1732.5	3.6	20	-6.17	-0.0036
20300	1745.0	3.6	20	-4.81	-0.0028

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	20	6.18	0.0036
20175	1732.5	4.1	20	-5.24	-0.0030
20300	1745.0	4.1	20	-5.89	-0.0034

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	20	7.21	0.0042
20175	1732.5	4.35	20	6.84	0.0039
20300	1745.0	4.35	20	-6.90	-0.0040

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

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	7.27	0.0042
20050	1720.0	3.6	-20	6.38	0.0037
20050	1720.0	3.6	-10	15.99	0.0093
20050	1720.0	3.6	0	10.09	0.0059
20050	1720.0	3.6	10	<b>-20.21</b>	<b>-0.0118</b>
20050	1720.0	3.6	20	9.94	0.0058
20050	1720.0	3.6	30	7.51	0.0044
20050	1720.0	3.6	40	8.75	0.0051
20050	1720.0	3.6	50	8.07	0.0047
20050	1720.0	3.6	60	6.54	0.0038
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	-30	8.14	0.0047
20050	1720.0	4.1	-20	6.59	0.0038
20050	1720.0	4.1	-10	7.67	0.0045
20050	1720.0	4.1	0	7.85	0.0046
20050	1720.0	4.1	10	7.88	0.0046
20050	1720.0	4.1	20	6.18	0.0036
20050	1720.0	4.1	30	6.58	0.0038
20050	1720.0	4.1	40	7.54	0.0044
20050	1720.0	4.1	50	6.49	0.0038
20050	1720.0	4.1	60	6.81	0.0040
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	-30	-6.69	-0.0039
20050	1720.0	4.35	-20	7.55	0.0044
20050	1720.0	4.35	-10	6.18	0.0036
20050	1720.0	4.35	0	-9.63	-0.0056
20050	1720.0	4.35	10	7.21	0.0042
20050	1720.0	4.35	20	7.21	0.0042
20050	1720.0	4.35	30	6.11	0.0036
20050	1720.0	4.35	40	7.28	0.0042
20050	1720.0	4.35	50	9.73	0.0057
20050	1720.0	4.35	60	8.80	0.0051

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-5.59	-0.0032
20175	1732.5	3.6	-20	4.81	0.0028
20175	1732.5	3.6	-10	4.53	0.0026
20175	1732.5	3.6	0	8.80	0.0051
20175	1732.5	3.6	10	16.67	0.0096
20175	1732.5	3.6	20	-6.17	-0.0036
20175	1732.5	3.6	30	-4.42	-0.0026
20175	1732.5	3.6	40	5.14	0.0030
20175	1732.5	3.6	50	5.85	0.0034
20175	1732.5	3.6	60	5.31	0.0031
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.1	-30	6.21	0.0036
20175	1732.5	4.1	-20	-16.02	-0.0092
20175	1732.5	4.1	-10	6.28	0.0036
20175	1732.5	4.1	0	6.24	0.0036
20175	1732.5	4.1	10	7.38	0.0043
20175	1732.5	4.1	20	-5.24	-0.0030
20175	1732.5	4.1	30	5.89	0.0034
20175	1732.5	4.1	40	6.87	0.0040
20175	1732.5	4.1	50	5.31	0.0031
20175	1732.5	4.1	60	-9.61	-0.0055
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.35	-30	9.33	0.0054
20175	1732.5	4.35	-20	7.87	0.0045
20175	1732.5	4.35	-10	5.72	0.0033
20175	1732.5	4.35	0	-3.56	-0.0021
20175	1732.5	4.35	10	7.82	0.0045
20175	1732.5	4.35	20	6.84	0.0039
20175	1732.5	4.35	30	-3.08	-0.0018
20175	1732.5	4.35	40	14.28	0.0082
20175	1732.5	4.35	50	-5.64	-0.0033
20175	1732.5	4.35	60	8.41	0.0049

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 5B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	-5.97	-0.0034
20300	1745.0	3.6	-20	-6.61	-0.0038
20300	1745.0	3.6	-10	-7.48	-0.0043
20300	1745.0	3.6	0	6.34	0.0036
20300	1745.0	3.6	10	-5.79	-0.0033
20300	1745.0	3.6	20	-4.81	-0.0028
20300	1745.0	3.6	30	3.36	0.0019
20300	1745.0	3.6	40	-2.29	-0.0013
20300	1745.0	3.6	50	5.99	0.0034
20300	1745.0	3.6	60	-8.07	-0.0046
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.1	-30	-9.57	-0.0055
20300	1745.0	4.1	-20	-7.75	-0.0044
20300	1745.0	4.1	-10	-6.75	-0.0039
20300	1745.0	4.1	0	-4.53	-0.0026
20300	1745.0	4.1	10	20.08	0.0115
20300	1745.0	4.1	20	-5.89	-0.0034
20300	1745.0	4.1	30	-4.02	-0.0023
20300	1745.0	4.1	40	-5.19	-0.0030
20300	1745.0	4.1	50	-9.11	-0.0052
20300	1745.0	4.1	60	6.22	0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.35	-30	-8.60	-0.0049
20300	1745.0	4.35	-20	-8.07	-0.0046
20300	1745.0	4.35	-10	6.71	0.0038
20300	1745.0	4.35	0	4.21	0.0024
20300	1745.0	4.35	10	-6.45	-0.0037
20300	1745.0	4.35	20	-6.90	-0.0040
20300	1745.0	4.35	30	-4.63	-0.0027
20300	1745.0	4.35	40	5.89	0.0034
20300	1745.0	4.35	50	-6.14	-0.0035
20300	1745.0	4.35	60	5.64	0.0032

## APPENDIX 6A– LTE Band 17 CONDUCTED RF EMISSIONS TEST DATA/PLOTS



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### LTE Band 17 Conducted RF Emission Test Data cont'd

The following tests were performed on product RGF111LW.

#### **Emission Designator Table**

<b>Frequency Range (MHz)</b>	<b>Conducted Output Power (dBm)</b>	<b>Emission Designator</b>	<b>Band</b>	<b>Bandwidth (MHz)</b>	<b>Modulation</b>
706.5-713.5	23.7	4M48G7D	LTE B17	5	QPSK
706.5-713.5	22.7	4M47D7W	LTE B17	5	16QAM
709-711	23.70	8M95G7D	LTE B17	10	QPSK
709-711	22.55	8M93D7W	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 9.275MHz. 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.



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	9.262	8.931	<b>8.931</b>
710.0	9.275	<b>8.946</b>	<b>8.931</b>
711.0	9.259	8.931	<b>8.931</b>

**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.

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 9.94 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.

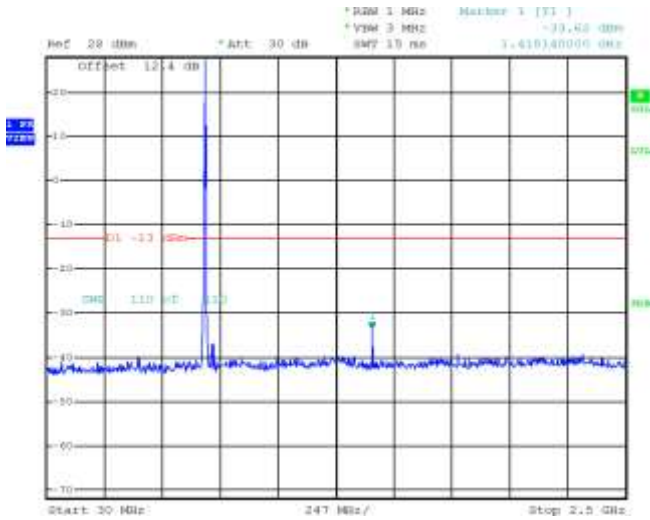
See Figures 6-25a to 6-32a for the plots of the Channel mask.

See Figures 6-33a to 6-36a for the plots of the Peak to Average Ratio.

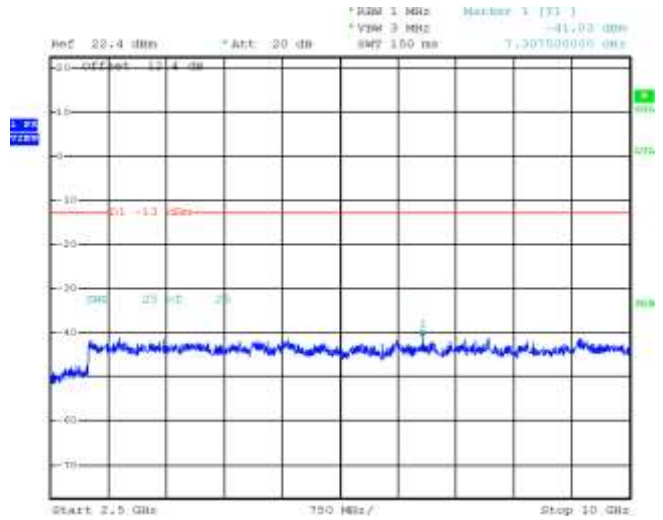
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

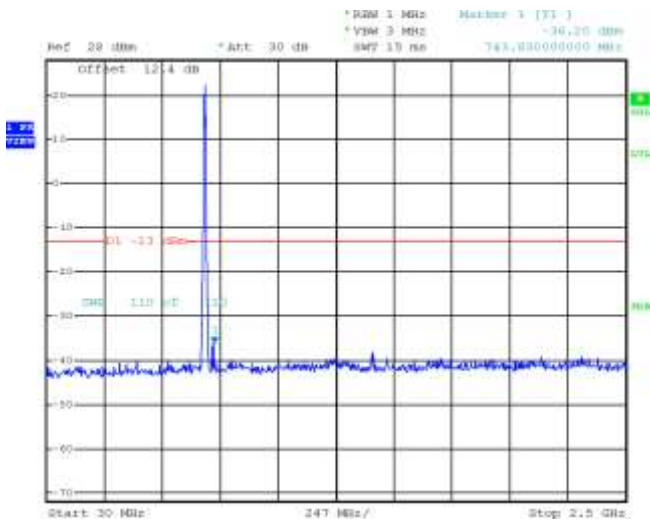
**Figure 6-1a: Band 17, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)**



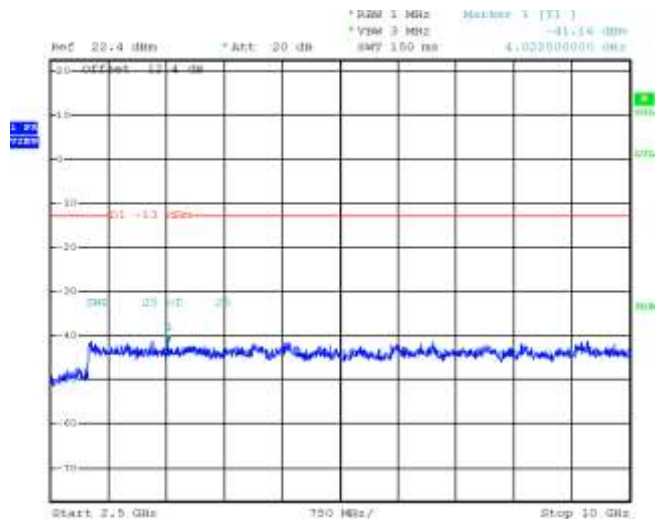
**Figure 6-2a: Band 17, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)**



**Figure 6-3a: Band 17, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)**



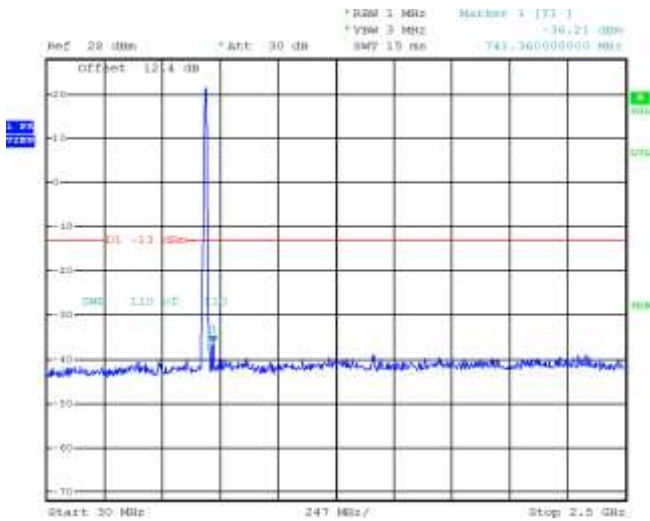
**Figure 6-4a: Band 17, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)**



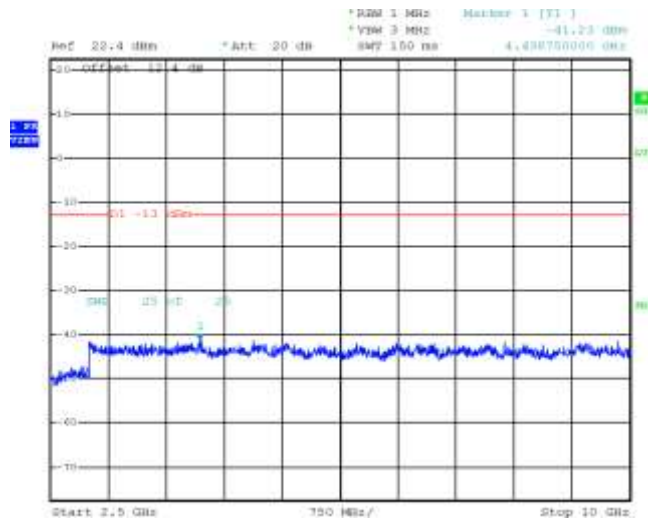
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>	
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>IC :</b> N/A <b>FCC ID:</b> L6ARGF110LW <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

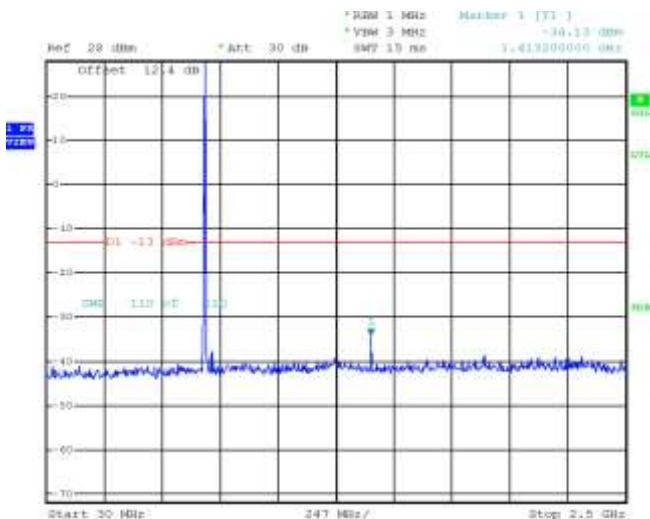
**Figure 6-5a: Band 17, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)**



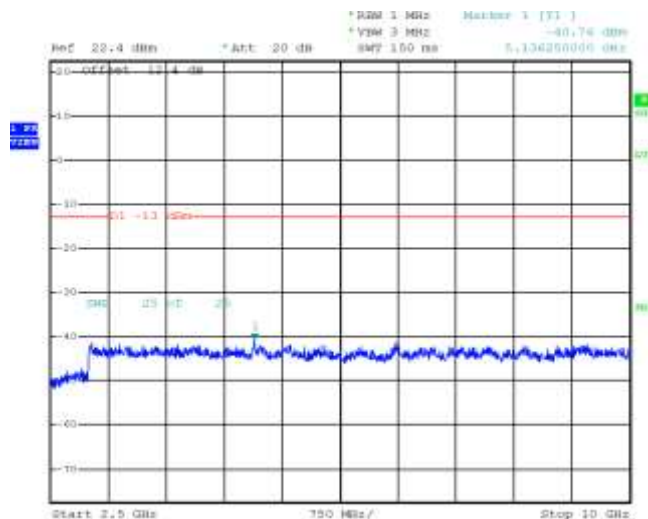
**Figure 6-6a: Band 17, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)**



**Figure 6-7a: Band 17, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)**



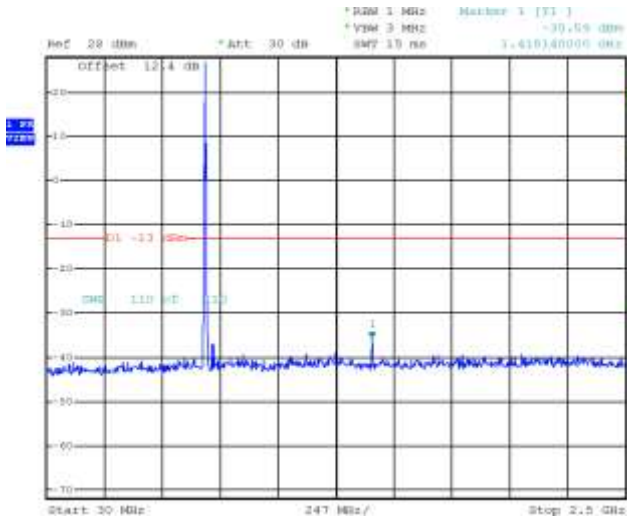
**Figure 6-8a: Band 17, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)**



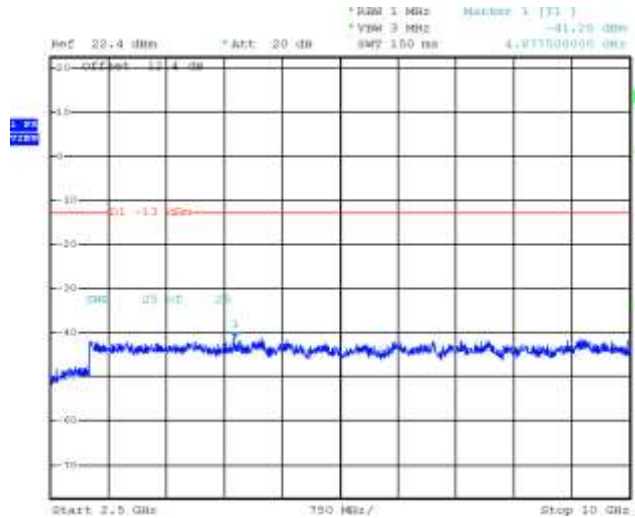
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

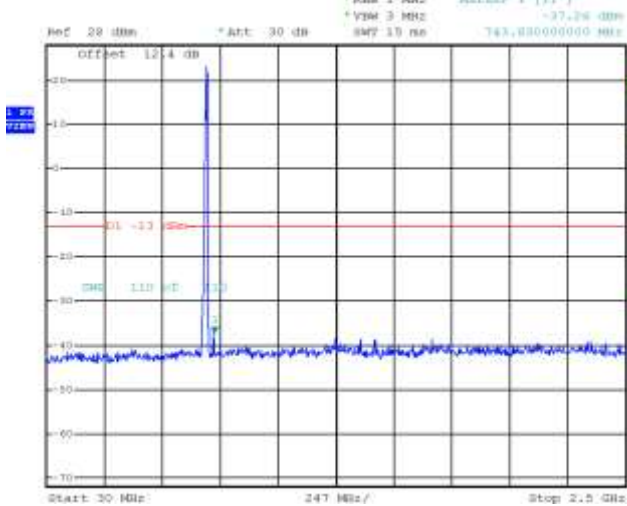
**Figure 6-9a: Band 17, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)**



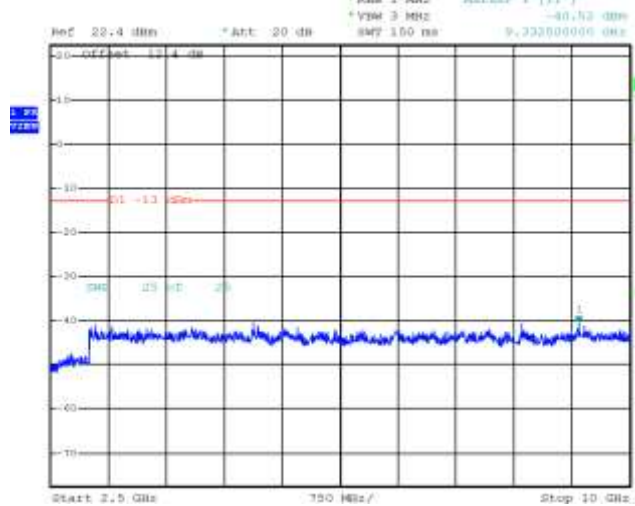
**Figure 6-10a: Band 17, Spurious Conducted Emissions, High Channel, 5MHz BW (RB= 15)**



**Figure 6-11a: Band 17, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)**



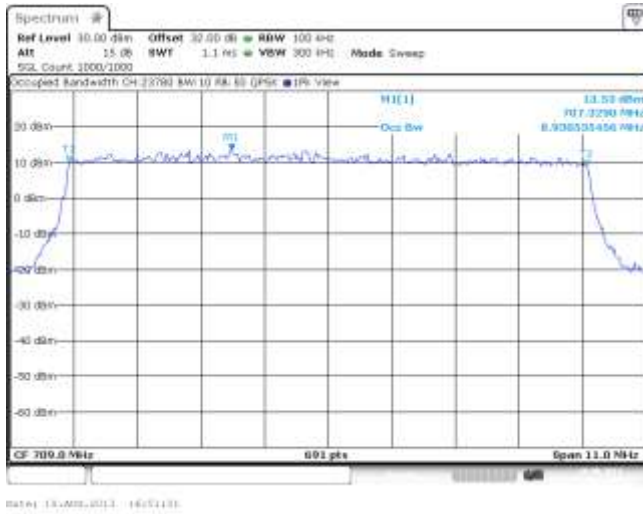
**Figure 6-12a: Band 17, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)**



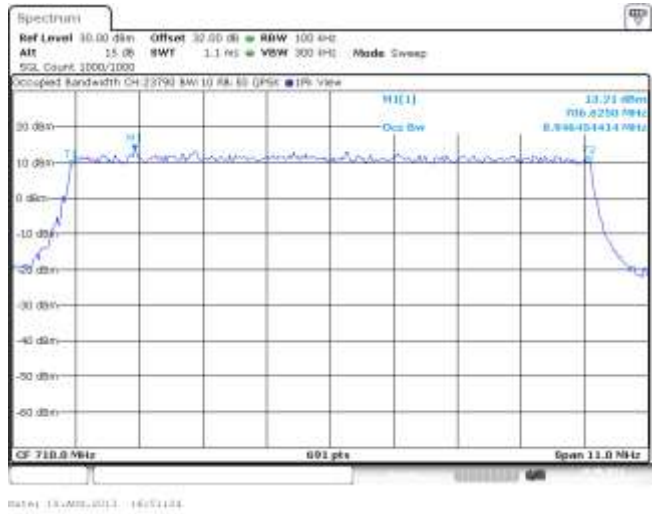
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

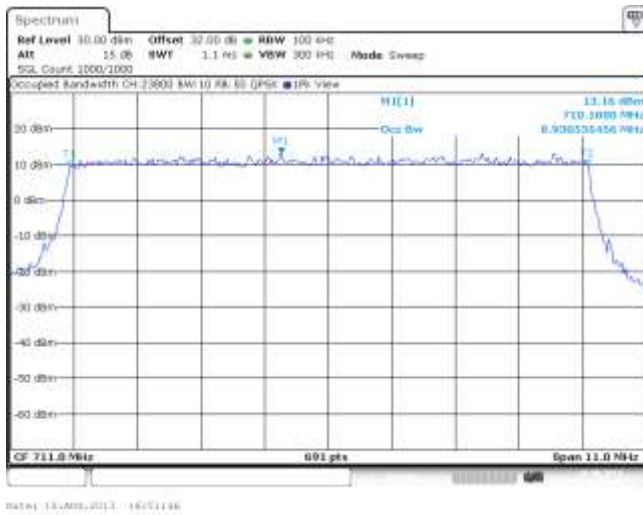
**Figure 6-13a: Occupied Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50**



**Figure 6-14a: Occupied Bandwidth, Band 17 Middle Channel, 10MHz BW, RB=50**



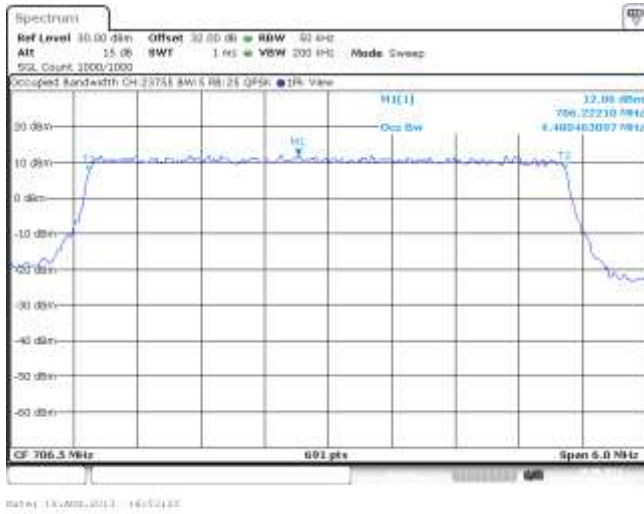
**Figure 6-15a: Occupied Bandwidth, Band 17 High Channel, 10MHz BW, RB=50**



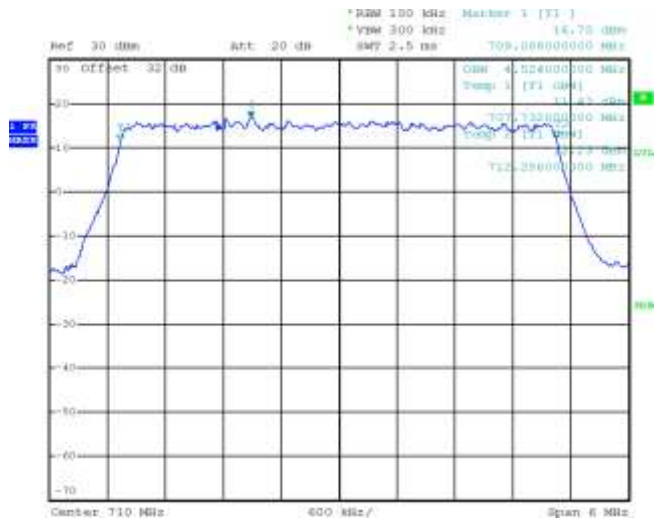
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

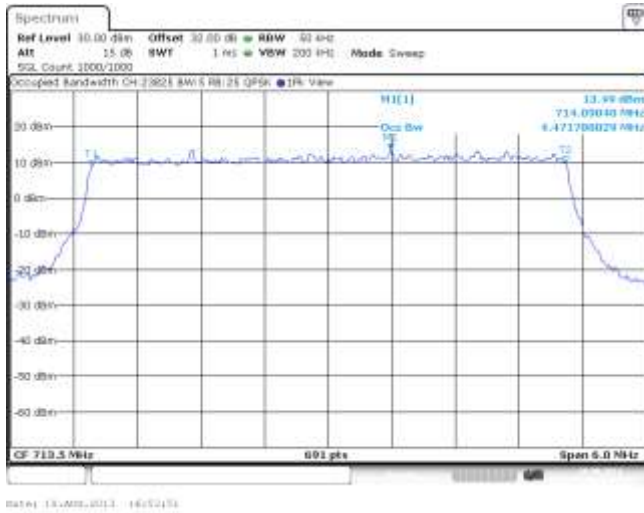
**Figure 6-16a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25**



**Figure 6-17a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=25**



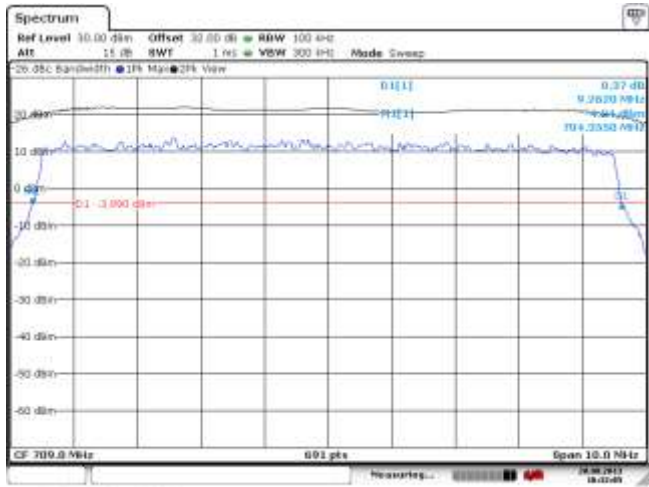
**Figure 6-18a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=25**



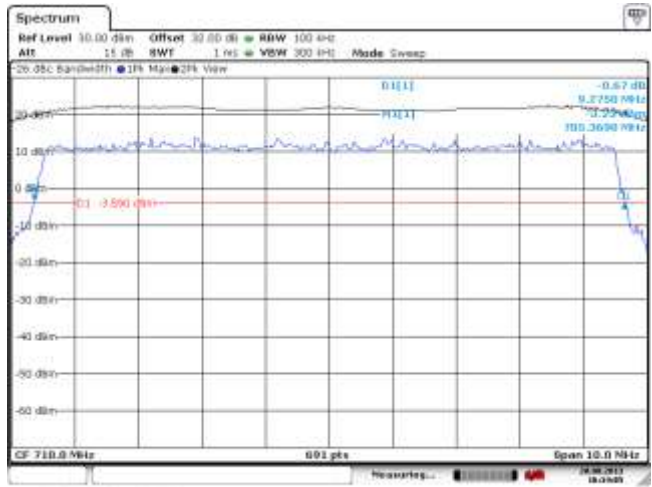
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

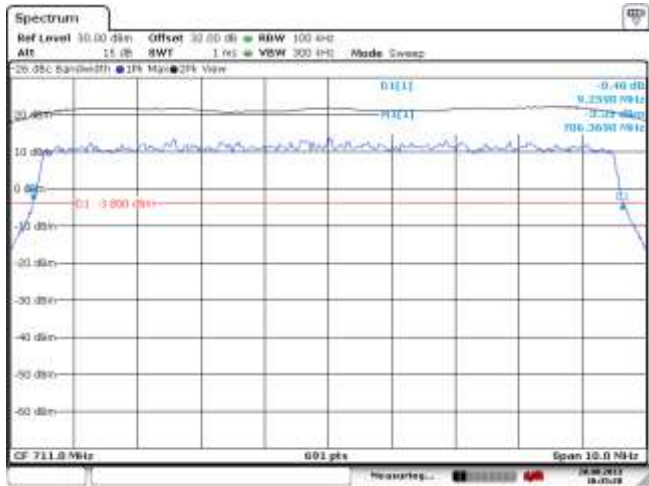
**Figure 6-19a: -26 dBc Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50**



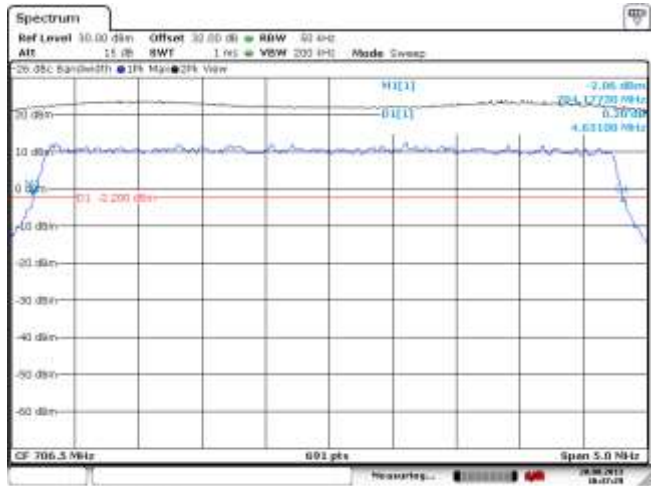
**Figure 6-20a: -26 dBc Bandwidth, Band 17 Middle Channel, 10MHz BW, RB=50**



**Figure 6-21a: -26 dBc Bandwidth, Band 17 High Channel, 10MHz BW, RB=50**



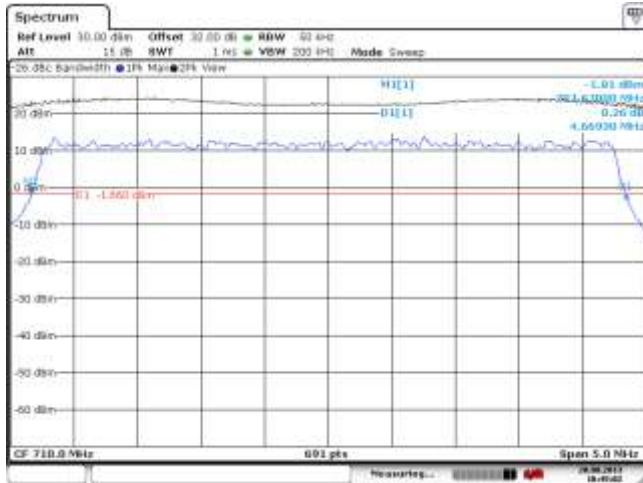
**Figure 6-22a: -26 dBc Bandwidth, Band 17 Low Channel, 5MHz BW, RB=25**



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

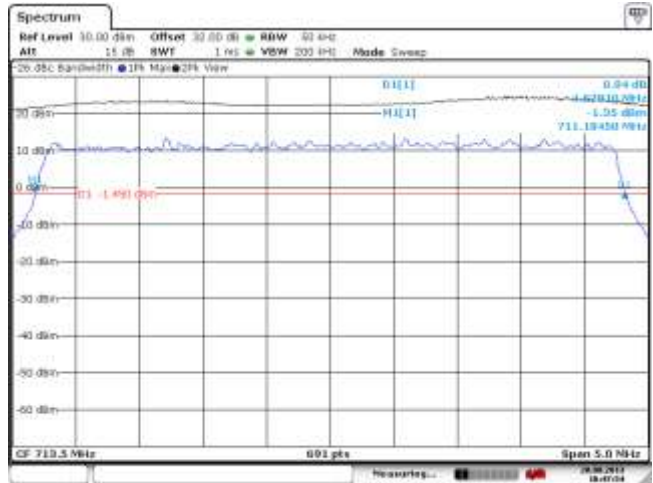
LTE Band 17 Conducted RF Emission Test Data cont'd

**Figure 6-23a: -26 dBc Bandwidth, Band 17 Middle Channel, 5MHz BW, RB=25**



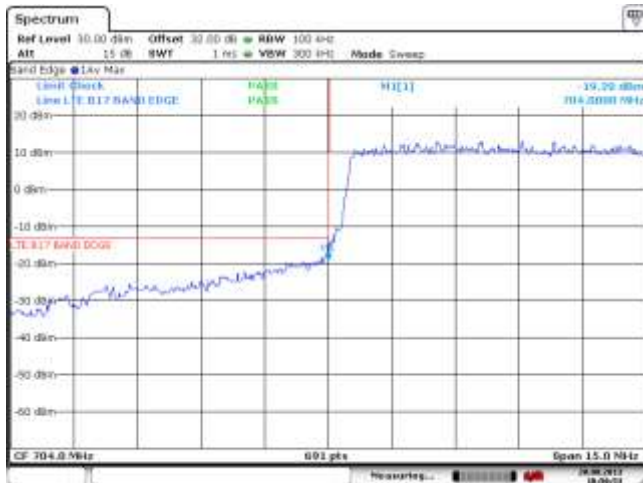
DATA: 25\_AUG\_2013 16:47:13

**Figure 6-24a: -26 dBc Bandwidth, Band 17 High Channel, 5MHz BW, RB=25**



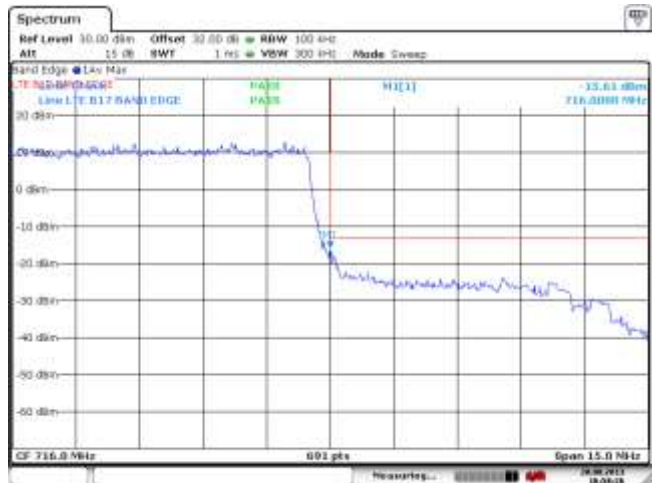
DATA: 25\_AUG\_2013 16:47:14

**Figure 6-25a: Band 17 Low Channel Mask, 10MHz BW, RB=50**



DATA: 25\_AUG\_2013 16:56:51

**Figure 6-26a: Band 17 High Channel Mask, 10MHz BW, RB=50**



DATA: 25\_AUG\_2013 16:56:56

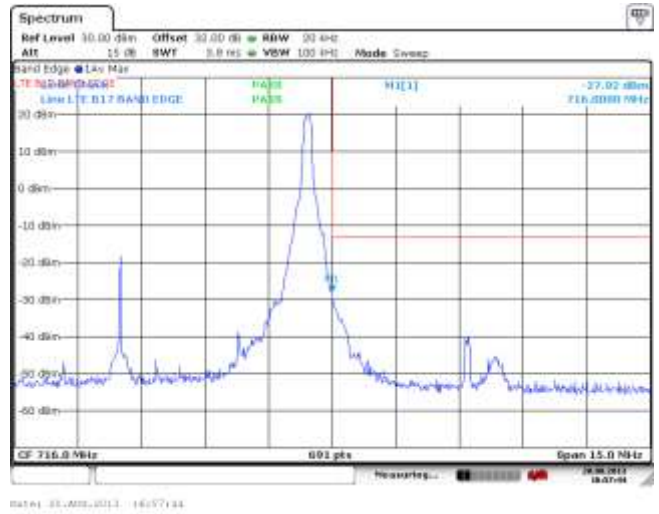
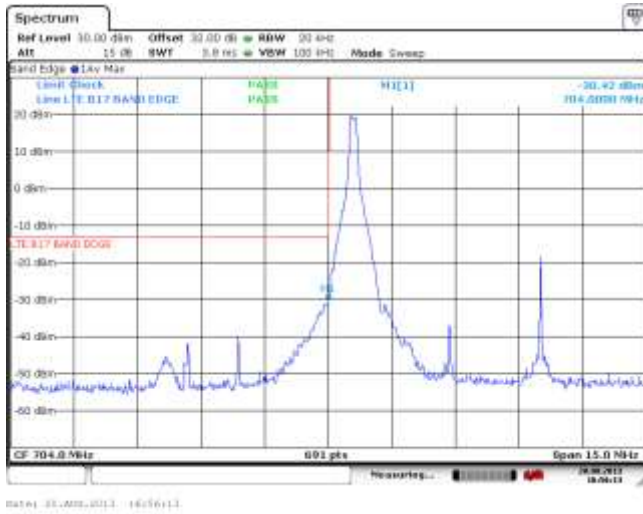


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

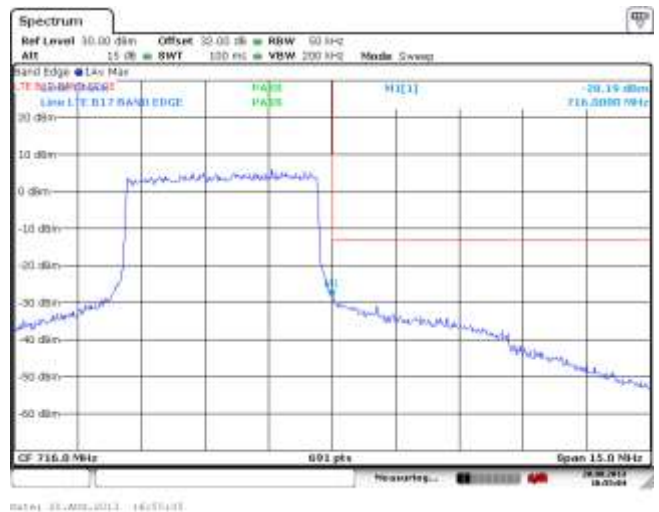
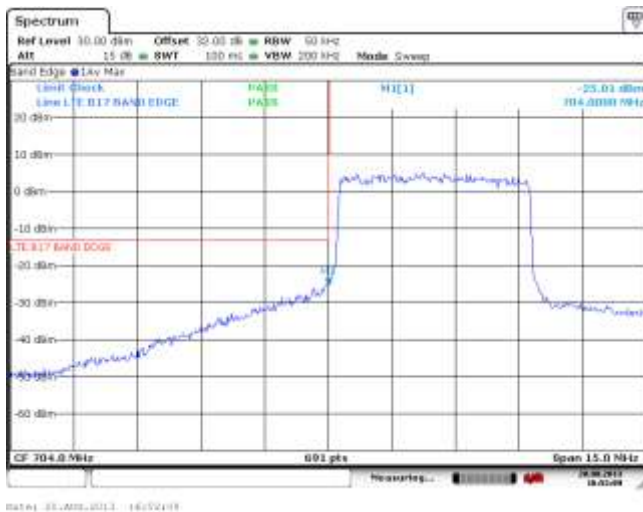
**Figure 6-27a: Band 17 Low Channel Mask, 10MHz BW, RB=1**

**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**

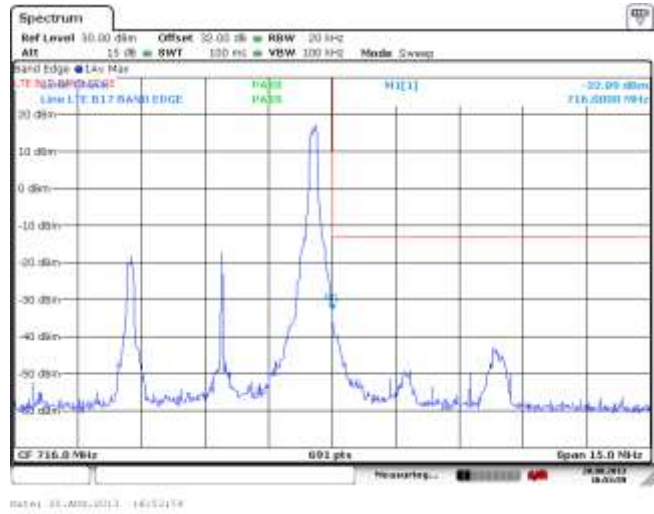
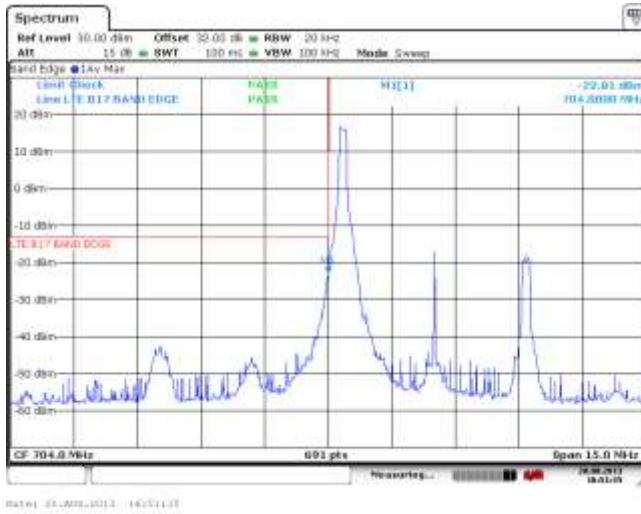


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

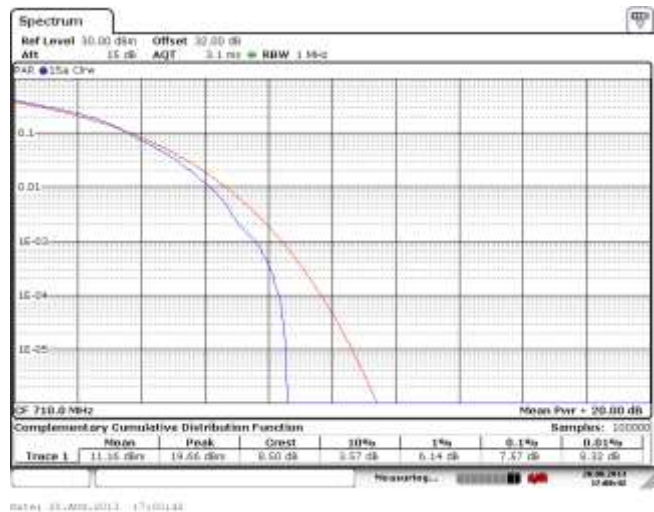
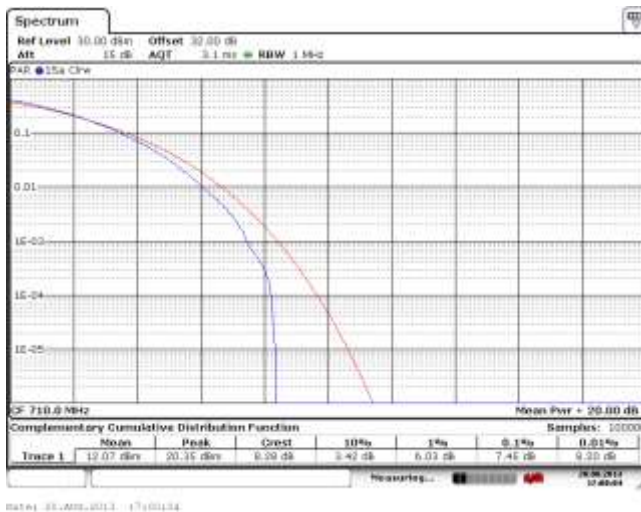
**Figure 6-31a: Band 17 Low Channel Mask, 5MHz BW, RB=1**

**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**

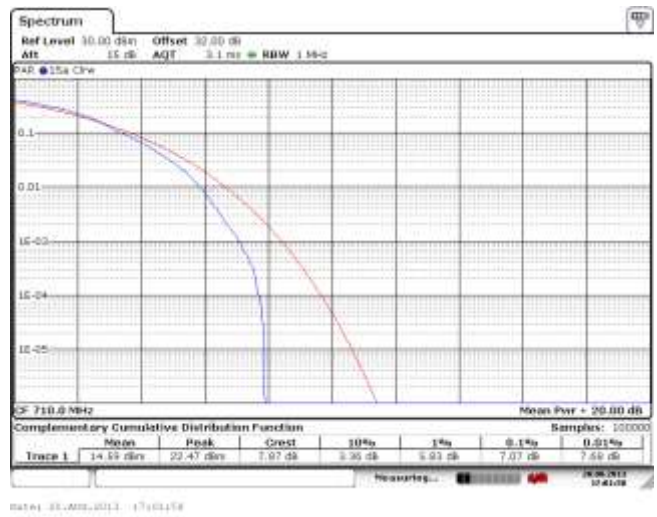
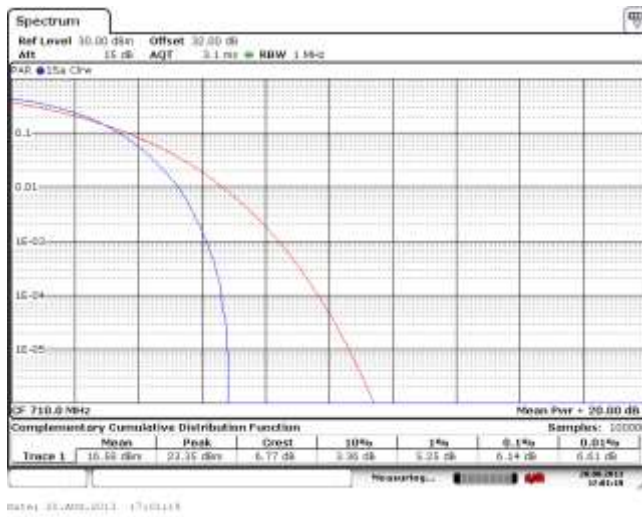


<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

**Figure 6-35a: Band 17 Mid Channel PAR, 5MHz BW, RB=15**

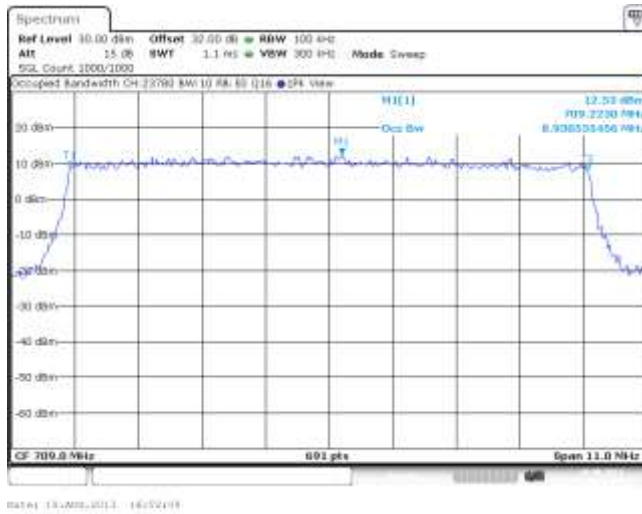
**Figure 6-36a: Band 17 Mid Channel PAR, 5MHz BW, RB=25**



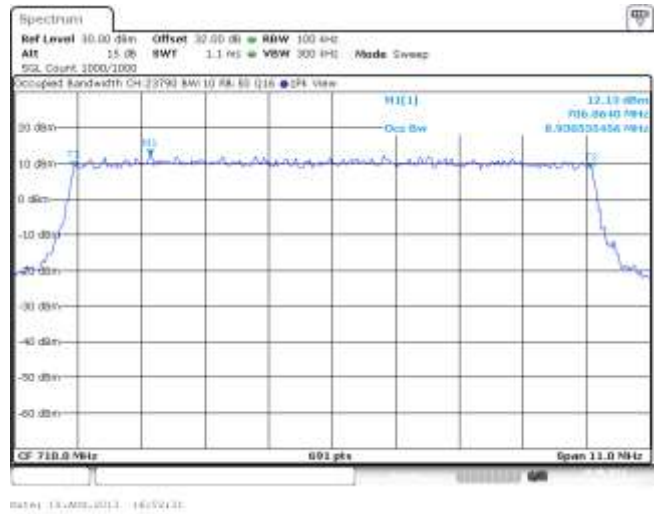
<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6A</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Conducted RF Emission Test Data cont'd

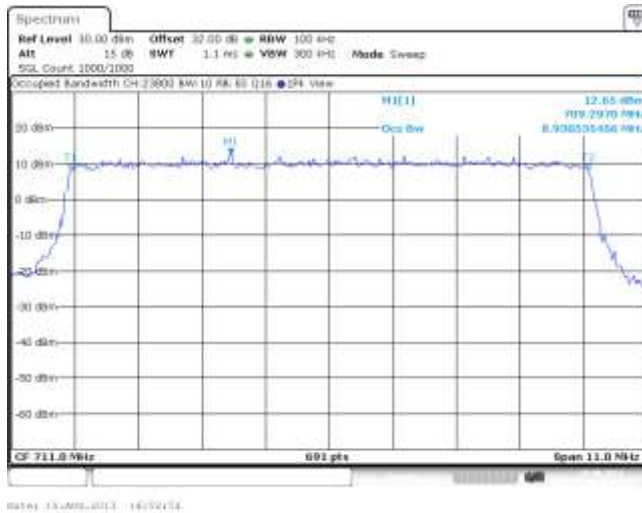
**Figure 6-37a: Occupied Bandwidth, Band 17 Low Channel, 20MHz BW (RB= 100) 16-QAM**



**Figure 6-38a: Occupied Bandwidth, Band 17 Mid Channel, 20MHz BW (RB= 100) 16-QAM**



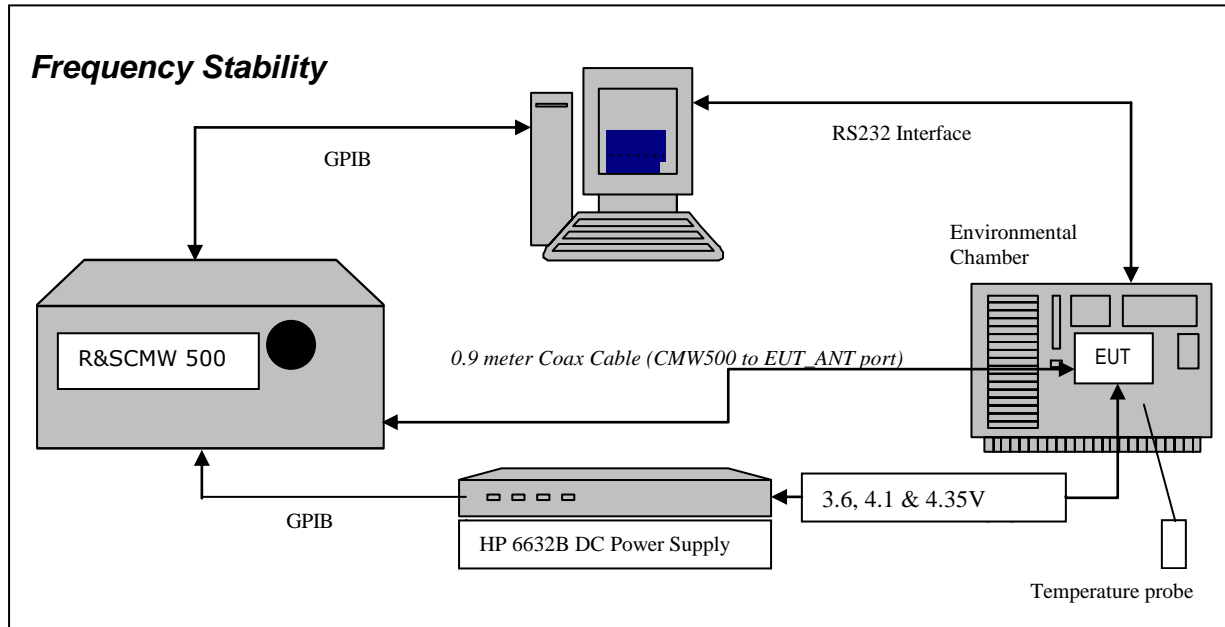
**Figure 6-39a: Occupied Bandwidth, Band 17 High Channel, 20MHz BW (RB= 100) 16-QAM**



APPENDIX 6B – LTE Band 17 FREQUENCY STABILITY TEST DATA

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

LTE Band 17 Frequency Stability Test Data



The following measurements were performed by Chuan Tran.

**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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

### 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.

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

Procedure:

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

43. Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
44. Start test program
45. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
46. Set power supply voltage to 3.6 volts.
47. Set up CMW 500 Radio Communication Tester.
48. Command the CMW 500 to switch to the low channel.
49. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
50. EUT is commanded to Transmit 100 Bursts.
51. 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.
52. The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
53. Repeat steps 5 to 10 changing the supply voltage to 4.1 Volts
54. Increase temperature by 10°C and soak for 1/2 hour.
55. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
56. 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 **-0.0176PPM**.



<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

The following tests were performed on product RGF111LW.

Date of test: August 20, 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	-2.55	-0.0036
23790	710.0	3.6	20	3.66	0.0052
23800	711.0	3.6	20	-3.28	-0.0046

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	20	-3.29	-0.0046
23790	710.0	4.1	20	1.99	0.0028
23800	711.0	4.1	20	-2.30	-0.0032

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	20	-2.45	-0.0035
23790	710.0	4.35	20	-2.12	-0.0030
23800	711.0	4.35	20	-2.50	-0.0035

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	3.85	0.0054
23780	709.0	3.6	-20	2.90	0.0041
23780	709.0	3.6	-10	3.22	0.0045
23780	709.0	3.6	0	-3.95	-0.0056
23780	709.0	3.6	10	2.79	0.0039
23780	709.0	3.6	20	-2.55	-0.0036
23780	709.0	3.6	30	-2.92	-0.0041
23780	709.0	3.6	40	3.78	0.0053
23780	709.0	3.6	50	-3.25	-0.0046
23780	709.0	3.6	60	-4.66	-0.0066
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	-30	-4.28	-0.0060
23780	709.0	4.1	-20	3.02	0.0043
23780	709.0	4.1	-10	11.50	0.0162
23780	709.0	4.1	0	2.65	0.0037
23780	709.0	4.1	10	8.33	0.0117
23780	709.0	4.1	20	-3.29	-0.0046
23780	709.0	4.1	30	-3.02	-0.0043
23780	709.0	4.1	40	2.65	0.0037
23780	709.0	4.1	50	-3.78	-0.0053
23780	709.0	4.1	60	-3.26	-0.0046
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	-30	-3.33	-0.0047
23780	709.0	4.35	-20	-3.56	-0.0050
23780	709.0	4.35	-10	-3.19	-0.0045
23780	709.0	4.35	0	3.25	0.0046
23780	709.0	4.35	10	2.82	0.0040
23780	709.0	4.35	20	-2.45	-0.0035
23780	709.0	4.35	30	-3.40	-0.0048
23780	709.0	4.35	40	-3.56	-0.0050
23780	709.0	4.35	50	-4.16	-0.0059
23780	709.0	4.35	60	-3.60	-0.0051

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	2.88	0.0041
23790	710.0	3.6	-20	0.99	0.0014
23790	710.0	3.6	-10	-2.36	-0.0033
23790	710.0	3.6	0	2.88	0.0041
23790	710.0	3.6	10	-1.75	-0.0025
23790	710.0	3.6	20	3.66	0.0052
23790	710.0	3.6	30	1.73	0.0024
23790	710.0	3.6	40	3.50	0.0049
23790	710.0	3.6	50	1.62	0.0023
23790	710.0	3.6	60	<b>-12.49</b>	<b>-0.0176</b>
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.1	-30	3.62	0.0051
23790	710.0	4.1	-20	3.99	0.0056
23790	710.0	4.1	-10	3.22	0.0045
23790	710.0	4.1	0	3.69	0.0052
23790	710.0	4.1	10	-5.72	-0.0081
23790	710.0	4.1	20	1.99	0.0028
23790	710.0	4.1	30	3.85	0.0054
23790	710.0	4.1	40	-6.48	-0.0091
23790	710.0	4.1	50	3.32	0.0047
23790	710.0	4.1	60	2.55	0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.35	-30	3.78	0.0053
23790	710.0	4.35	-20	2.98	0.0042
23790	710.0	4.35	-10	3.20	0.0045
23790	710.0	4.35	0	3.43	0.0048
23790	710.0	4.35	10	3.28	0.0046
23790	710.0	4.35	20	-2.12	-0.0030
23790	710.0	4.35	30	3.25	0.0046
23790	710.0	4.35	40	3.12	0.0044
23790	710.0	4.35	50	2.63	0.0037
23790	710.0	4.35	60	3.50	0.0049

<b>BlackBerry RTS</b>	EMI Test Report for the BlackBerry® smartphone Model RGE111LW, RGF111LW <b>APPENDIX 6B</b>		
<b>Test Report No.:</b> RTS-6050-1309-23A	<b>Dates of Test:</b> August 16 to September 9, 2013	<b>FCC ID:</b> N/A <b>FCC ID:</b> L6ARGF110LW	<b>IC :</b> N/A <b>IC :</b> 2503A-RGF110LW

**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	5.79	0.0081
23800	711.0	3.6	-20	5.69	0.0080
23800	711.0	3.6	-10	7.07	0.0099
23800	711.0	3.6	0	-3.19	-0.0045
23800	711.0	3.6	10	-7.12	-0.0100
23800	711.0	3.6	20	-3.28	-0.0046
23800	711.0	3.6	30	6.69	0.0094
23800	711.0	3.6	40	-3.33	-0.0047
23800	711.0	3.6	50	-3.75	-0.0053
23800	711.0	3.6	60	-3.03	-0.0043
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.1	-30	-2.95	-0.0041
23800	711.0	4.1	-20	-3.32	-0.0047
23800	711.0	4.1	-10	-4.08	-0.0057
23800	711.0	4.1	0	-3.33	-0.0047
23800	711.0	4.1	10	-3.22	-0.0045
23800	711.0	4.1	20	-2.30	-0.0032
23800	711.0	4.1	30	-3.43	-0.0048
23800	711.0	4.1	40	-2.90	-0.0041
23800	711.0	4.1	50	-4.16	-0.0059
23800	711.0	4.1	60	-4.09	-0.0058
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.35	-30	-2.85	-0.0040
23800	711.0	4.35	-20	-3.49	-0.0049
23800	711.0	4.35	-10	-3.63	-0.0051
23800	711.0	4.35	0	2.89	0.0041
23800	711.0	4.35	10	-2.63	-0.0037
23800	711.0	4.35	20	-2.50	-0.0035
23800	711.0	4.35	30	-3.35	-0.0047
23800	711.0	4.35	40	-3.33	-0.0047
23800	711.0	4.35	50	-2.95	-0.0041
23800	711.0	4.35	60	-3.42	-0.0048