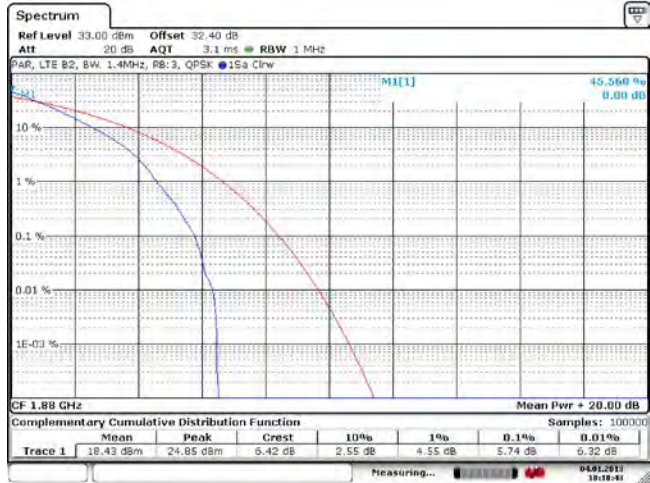
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 3A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW


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

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



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

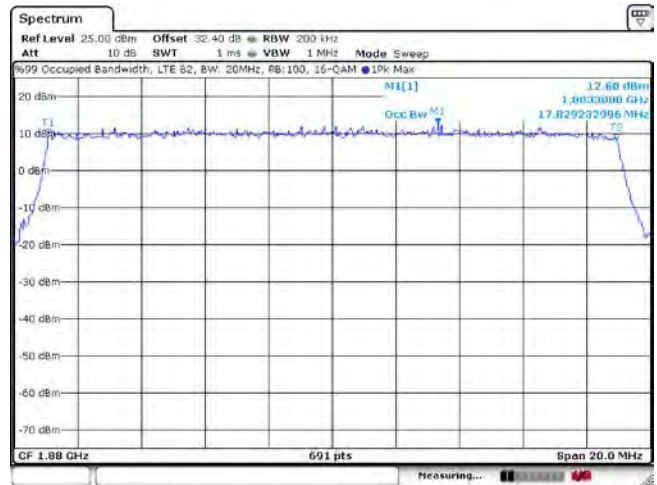
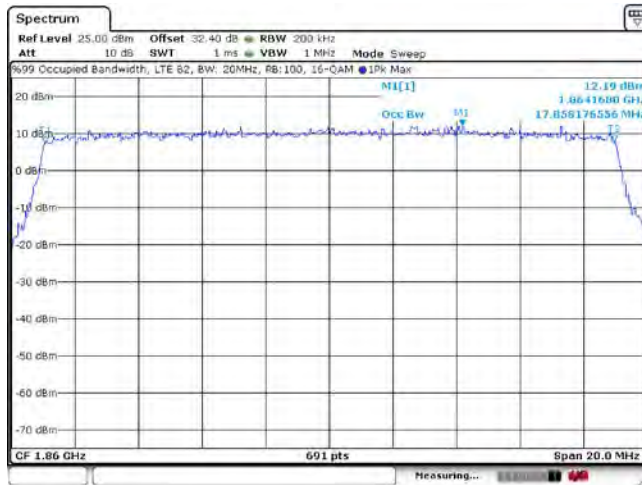


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 3A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

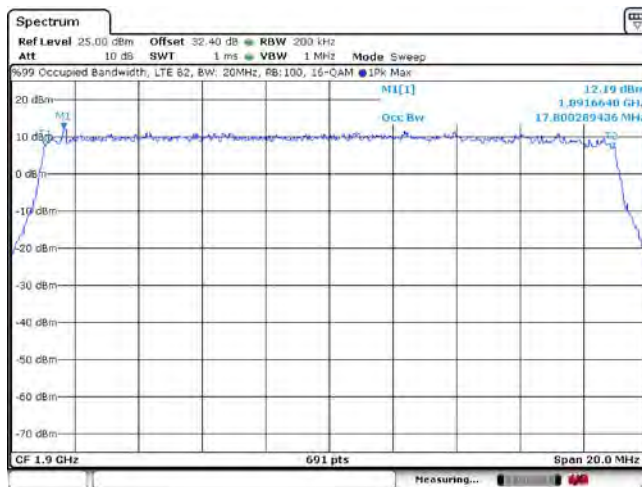
**LTE Band 2 Conducted RF Emission Test Data cont'd**

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


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



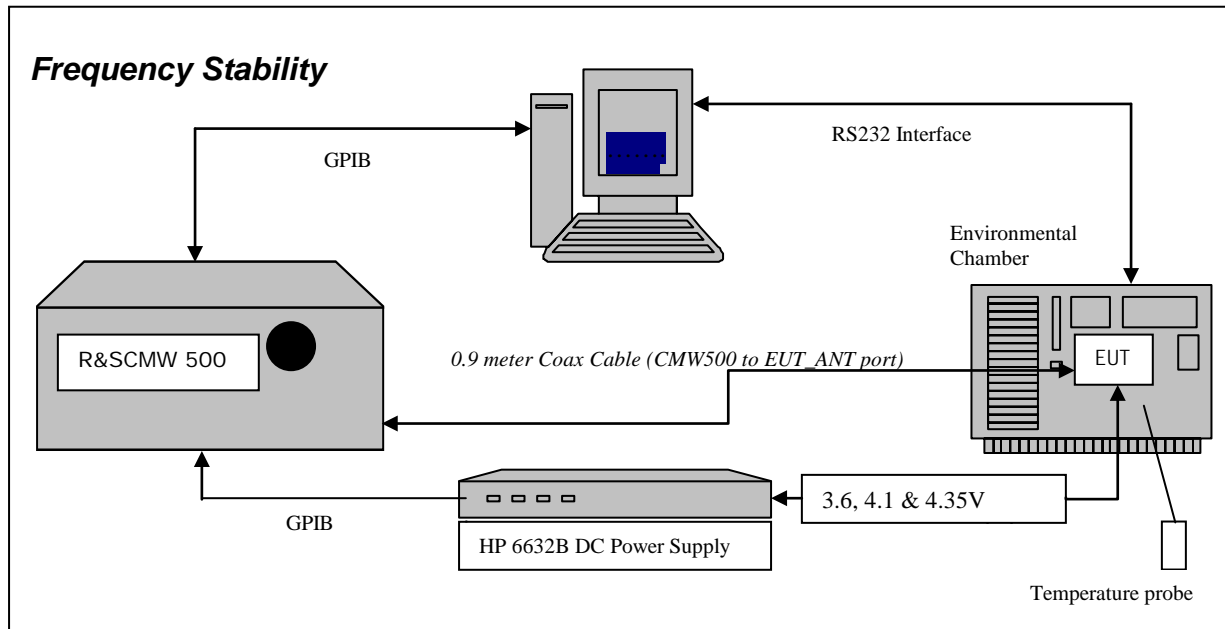
**Figure 3-45a: Occupied Bandwidth, Band 2 High Channel, 20MHz BW (RB= 100) 16-QAM**



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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 3B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### LTE Frequency Stability Test Data



The following measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

**2.1055** Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation


(d) Frequency Stability - Voltage Variation

**24.236** *Frequency Stability.*

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

*The EUT meets the requirements as stated in CFR 47 chapter 1, Section 24.235, CFR 47 and RSS-133, 6.3 Frequency Stability.*

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 3B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.


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

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMW 500 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

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

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 1860.0, 1880.0 and 1900.0 MHz each was measured under bandwidth of 20 MHz with maximum (100) resource blocks. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.

After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 3B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW


**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 **0.009 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 3B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

Date of test: January 04, 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	10.96	0.0059
18900	1880.0	3.6	20	13.18	0.0070
19199	1900.0	3.6	20	-1.61	-0.0008

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	20	7.62	0.0041
18900	1880.0	4.1	20	11.95	0.0064
19199	1900.0	4.1	20	-4.60	-0.0024

Traffic Channel Number	LTE Band 2 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	20	8.91	0.0048
18900	1880.0	4.35	20	10.81	0.0057
19199	1900.0	4.35	20	-0.94	-0.0005

Test Report No.:  
 RTS-6026-1302-12\_Rev1

Dates of Test:  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**LTE band 2 Results: channel 18600 @ maximum transmitted power**

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	3.6	-30	22.44	0.0121
18600	1860.0	3.6	-20	10.08	0.0054
18600	1860.0	3.6	-10	7.26	0.0039
18600	1860.0	3.6	0	10.01	0.0054
18600	1860.0	3.6	10	11.29	0.0061
18600	1860.0	3.6	20	10.96	0.0059
18600	1860.0	3.6	30	10.52	0.0057
18600	1860.0	3.6	40	13.85	0.0074
18600	1860.0	3.6	50	-8.85	-0.0048
18600	1860.0	3.6	60	10.50	0.0056
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.1	-30	9.74	0.0052
18600	1860.0	4.1	-20	11.92	0.0064
18600	1860.0	4.1	-10	14.87	0.0080
18600	1860.0	4.1	0	9.94	0.0053
18600	1860.0	4.1	10	11.47	0.0062
18600	1860.0	4.1	20	7.62	0.0041
18600	1860.0	4.1	30	9.58	0.0051
18600	1860.0	4.1	40	14.53	0.0078
18600	1860.0	4.1	50	-4.29	-0.0023
18600	1860.0	4.1	60	9.13	0.0049
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18600	1860.0	4.35	-30	9.61	0.0052
18600	1860.0	4.35	-20	7.75	0.0042
18600	1860.0	4.35	-10	13.13	0.0071
18600	1860.0	4.35	0	11.05	0.0059
18600	1860.0	4.35	10	11.87	0.0064
18600	1860.0	4.35	20	8.91	0.0048
18600	1860.0	4.35	30	16.74	0.0090
18600	1860.0	4.35	40	-6.50	-0.0035
18600	1860.0	4.35	50	13.19	0.0071
18600	1860.0	4.35	60	13.64	0.0073



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Dates of Test:  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**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	11.95	0.0064
18900	1880.00	3.6	-20	8.49	0.0045
18900	1880.00	3.6	-10	10.26	0.0055
18900	1880.00	3.6	0	-4.85	-0.0026
18900	1880.00	3.6	10	9.21	0.0049
18900	1880.00	3.6	20	13.18	0.0070
18900	1880.00	3.6	30	11.68	0.0062
18900	1880.00	3.6	40	13.72	0.0073
18900	1880.00	3.6	50	12.09	0.0064
18900	1880.00	3.6	60	13.70	0.0073
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.1	-30	10.85	0.0058
18900	1880.00	4.1	-20	-10.05	-0.0053
18900	1880.00	4.1	-10	-3.34	-0.0018
18900	1880.00	4.1	0	13.65	0.0073
18900	1880.00	4.1	10	9.47	0.0050
18900	1880.00	4.1	20	11.95	0.0064
18900	1880.00	4.1	30	12.21	0.0065
18900	1880.00	4.1	40	11.16	0.0059
18900	1880.00	4.1	50	-11.14	-0.0059
18900	1880.00	4.1	60	12.33	0.0066
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
18900	1880.00	4.35	-30	-12.45	-0.0066
18900	1880.00	4.35	-20	6.48	0.0034
18900	1880.00	4.35	-10	12.91	0.0069
18900	1880.00	4.35	0	10.60	0.0056
18900	1880.00	4.35	10	11.32	0.0060
18900	1880.00	4.35	20	10.81	0.0057
18900	1880.00	4.35	30	14.56	0.0077
18900	1880.00	4.35	40	<b>16.99</b>	<b>0.0090</b>
18900	1880.00	4.35	50	11.60	0.0062
18900	1880.00	4.35	60	12.91	0.0069

Test Report No.:  
 RTS-6026-1302-12\_Rev1


Dates of Test:  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**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	-7.56	-0.0040
19199	1900.0	3.6	-20	-5.01	-0.0026
19199	1900.0	3.6	-10	6.48	0.0034
19199	1900.0	3.6	0	9.09	0.0048
19199	1900.0	3.6	10	-6.57	-0.0035
19199	1900.0	3.6	20	-1.61	-0.0008
19199	1900.0	3.6	30	-4.97	-0.0026
19199	1900.0	3.6	40	-5.30	-0.0028
19199	1900.0	3.6	50	-1.52	-0.0008
19199	1900.0	3.6	60	-5.46	-0.0029
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.1	-30	-3.06	-0.0016
19199	1900.0	4.1	-20	-3.11	-0.0016
19199	1900.0	4.1	-10	-8.11	-0.0043
19199	1900.0	4.1	0	-2.66	-0.0014
19199	1900.0	4.1	10	-4.91	-0.0026
19199	1900.0	4.1	20	-4.60	-0.0024
19199	1900.0	4.1	30	-5.09	-0.0027
19199	1900.0	4.1	40	-5.78	-0.0030
19199	1900.0	4.1	50	-8.69	-0.0046
19199	1900.0	4.1	60	-6.89	-0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
19199	1900.0	4.35	-30	-3.77	-0.0020
19199	1900.0	4.35	-20	-2.74	-0.0014
19199	1900.0	4.35	-10	-6.72	-0.0035
19199	1900.0	4.35	0	-2.25	-0.0012
19199	1900.0	4.35	10	-5.63	-0.0030
19199	1900.0	4.35	20	-0.94	-0.0005
19199	1900.0	4.35	30	-10.53	-0.0055
19199	1900.0	4.35	40	12.40	0.0065
19199	1900.0	4.35	50	-4.68	-0.0025
19199	1900.0	4.35	60	-2.74	-0.0014

## APPENDIX 3C – LTE Band 2 RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 3C</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### Radiated Power Test Data Results

Date of Test: January 15, 2013

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 25.0 °C  
Relative Humidity: 29.5 %

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

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

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

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

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	18700	1860.00	2	Horn	V	-28.92	-27.16	V-V	-16.48	22.80	0.19	33.00	-10.20
F0	18700	1860.00	2	Horn	H	-27.16		H-H	-16.31				
F0	18900	1880.00	2	Horn	V	-29.84	-27.92	V-V	-17.36	22.31	0.17	33.00	-10.69
F0	18900	1880.00	2	Horn	H	-27.92		H-H	-16.63				
F0	19099	1899.90	2	Horn	V	-30.16	-27.21	V-V	-16.56	<b>23.66</b>	<b>0.23</b>	33.00	-9.34
F0	19099	1899.90	2	Horn	H	-27.21		H-H	-15.49				

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


								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	18700	1860.00	2	Horn	V	-30.24	-28.49	V-V	-17.84	21.42	0.14	33.00	-11.58
F0	18700	1860.00	2	Horn	H	-28.49		H-H	-17.69				
F0	18900	1880.00	2	Horn	V	-30.74	-28.67	V-V	-18.14	21.55	0.14	33.00	-11.45
F0	18900	1880.00	2	Horn	H	-28.67		H-H	-17.39				
F0	19099	1899.90	2	Horn	V	-32.81	-28.50	V-V	-17.86	<b>22.38</b>	<b>0.17</b>	33.00	-10.62
F0	19099	1899.90	2	Horn	H	-28.50		H-H	-16.77				

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



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

#### Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Emission Designator	Band	Bandwidth (MHz)	Modulation
824.7-848.2	23.73	1M09G7D	LTE B5	1.4	QPSK
824.7-848.2	22.50	1M09D7W	LTE B5	1.4	16QAM
825.5-847.5	23.80	2M68G7D	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	8M92G7D	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 9.320 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.



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	<b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

**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	9.291	8.929	8.929
836.5	9.320	8.944	8.929
843.9	9.276	8.929	8.929

**Measurement Plots for LTE Band 5**

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

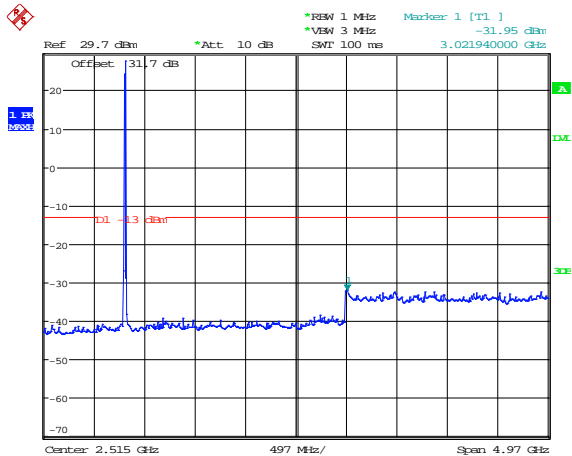
See Figures 4-19a to 4-36a and 4-45a to 4-47a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

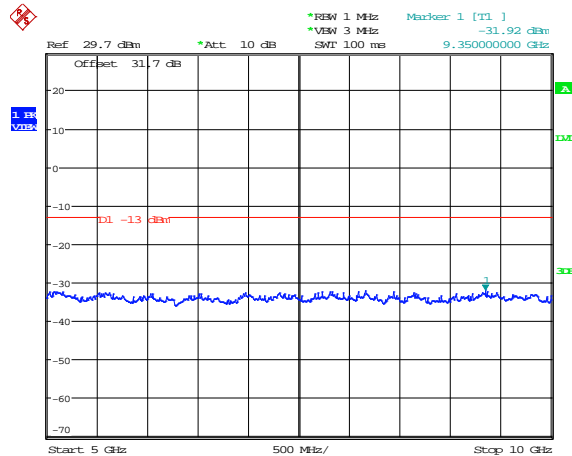
### LTE Band 5 Conducted RF Emission Test Data cont'd

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



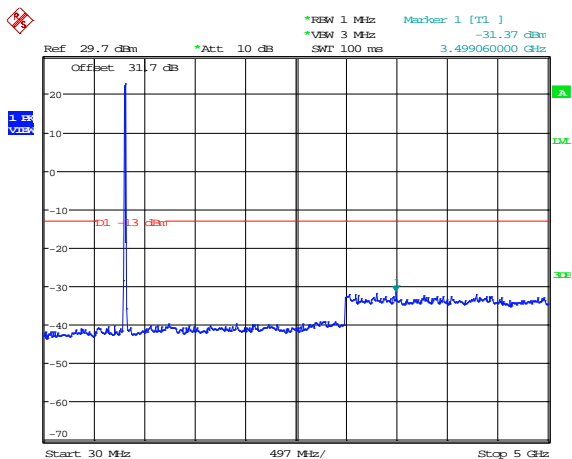
Date: 21.JAN.2013 10:39:45

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



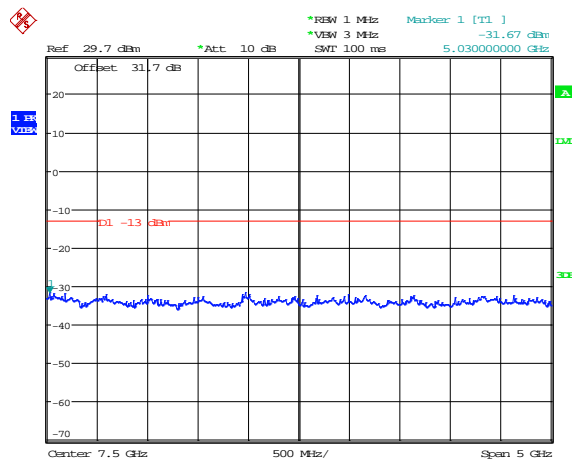
Date: 21.JAN.2013 10:41:58

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




Date: 21.JAN.2013 10:44:25

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

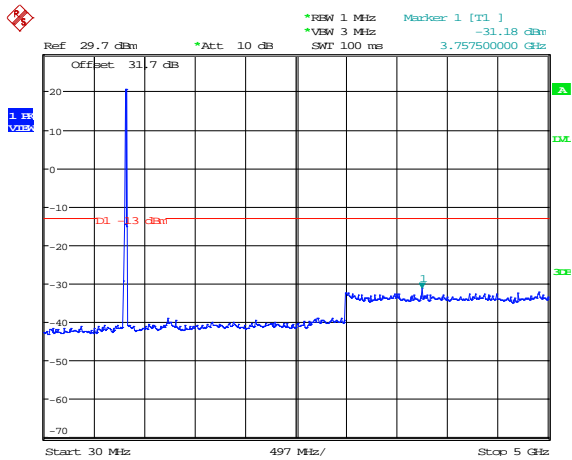


Date: 21.JAN.2013 10:43:12

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

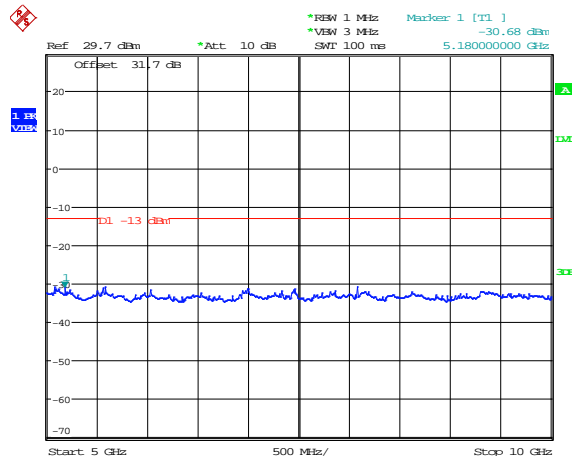
LTE Band 5 Conducted RF Emission Test Data cont'd

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



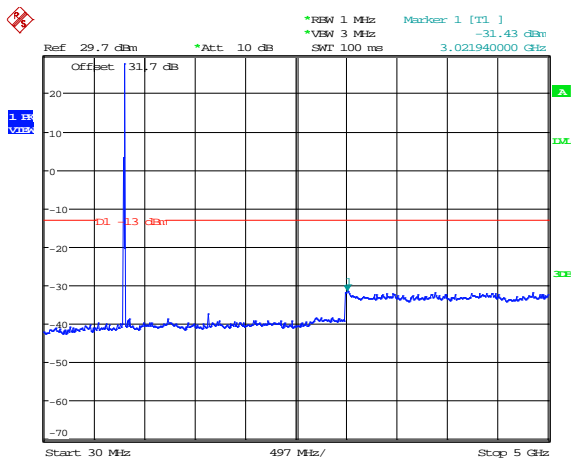
Date: 21.JAN.2013 11:06:45

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



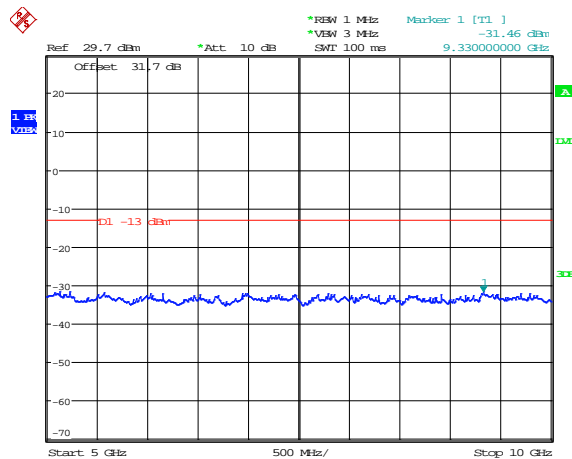
Date: 21.JAN.2013 11:05:45

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




Date: 21.JAN.2013 11:11:42

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

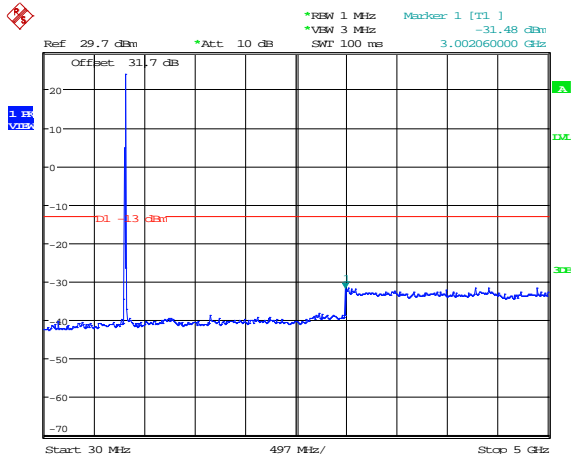


Date: 21.JAN.2013 11:14:15

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

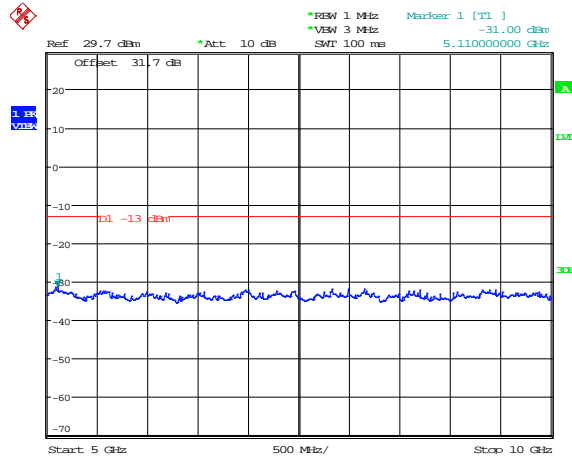
**LTE Band 5 Conducted RF Emission Test Data cont'd**

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



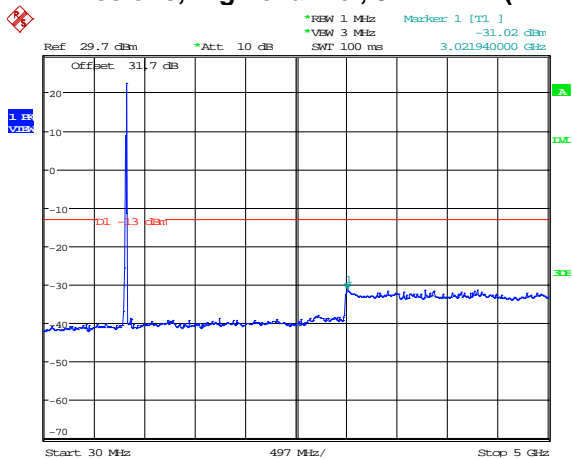
Date: 21.JAN.2013 11:19:28

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



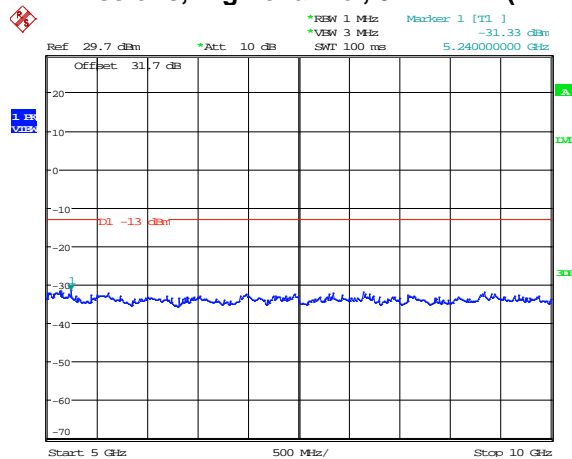
Date: 21.JAN.2013 11:16:14

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




Date: 21.JAN.2013 11:27:51

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

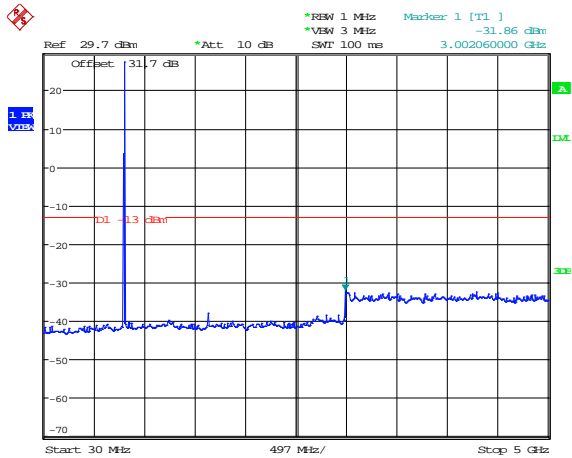


Date: 21.JAN.2013 11:28:56

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

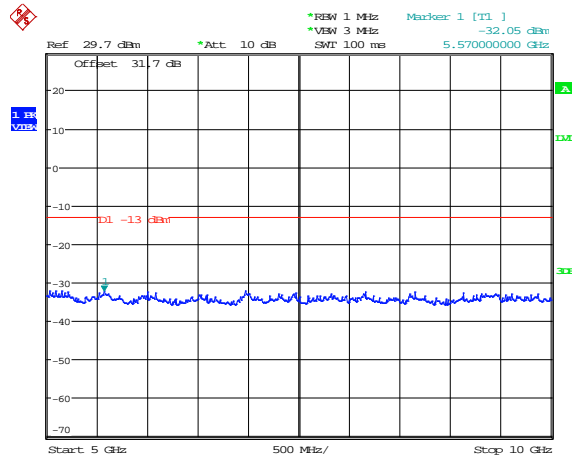
**LTE Band 5 Conducted RF Emission Test Data cont'd**

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



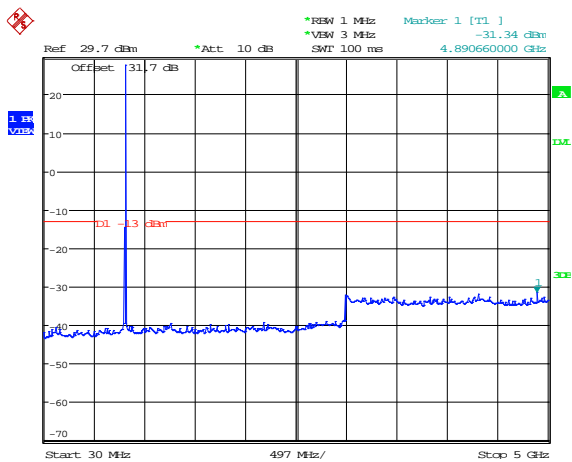
Date: 21.JAN.2013 11:32:19

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



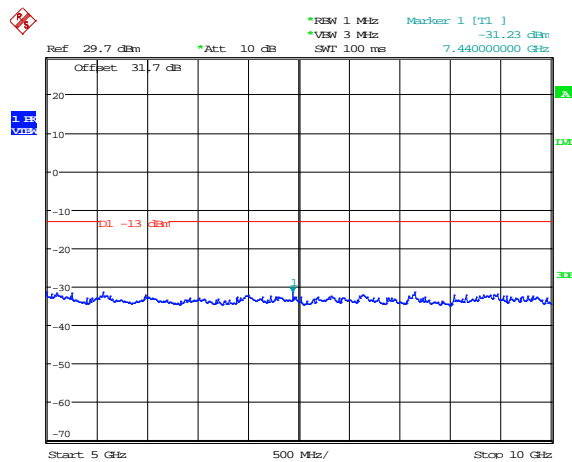
Date: 21.JAN.2013 11:30:17

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




Date: 21.JAN.2013 11:33:32

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

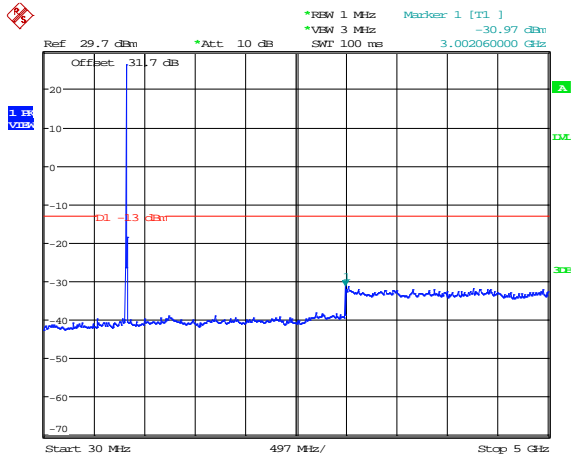


Date: 21.JAN.2013 11:36:20

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

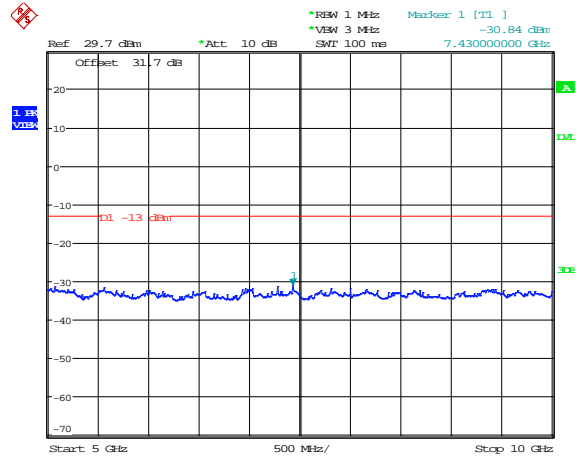
LTE Band 5 Conducted RF Emission Test Data cont'd

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




Date: 21.JAN.2013 11:42:57

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



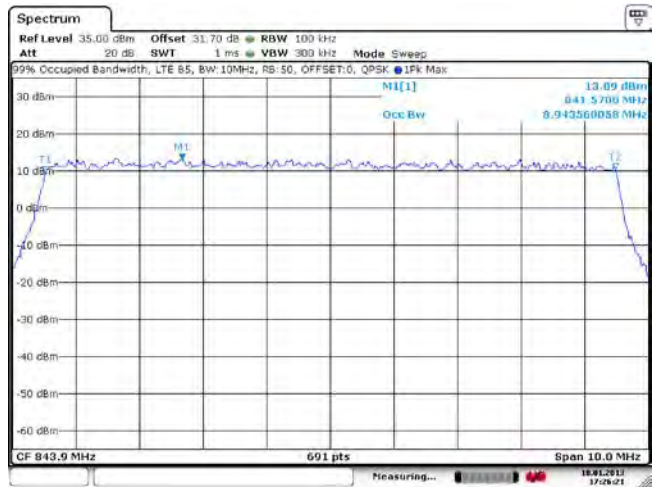
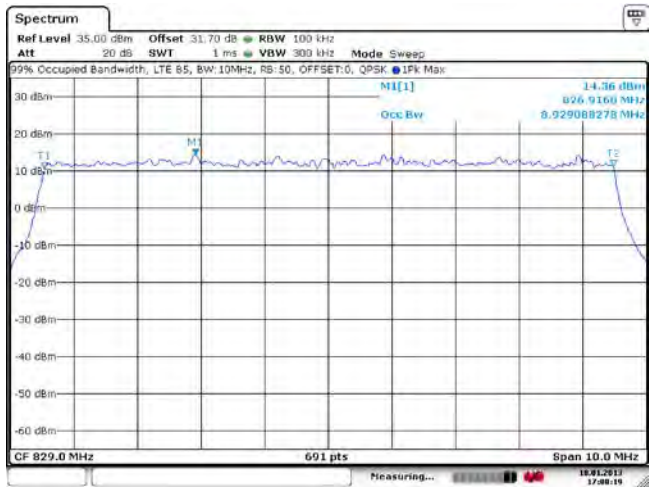
Date: 21.JAN.2013 11:40:08

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

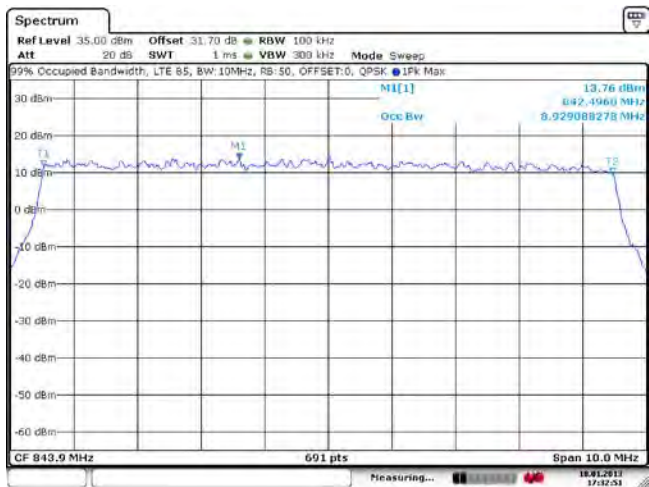
LTE Band 5 Conducted RF Emission Test Data cont'd


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

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



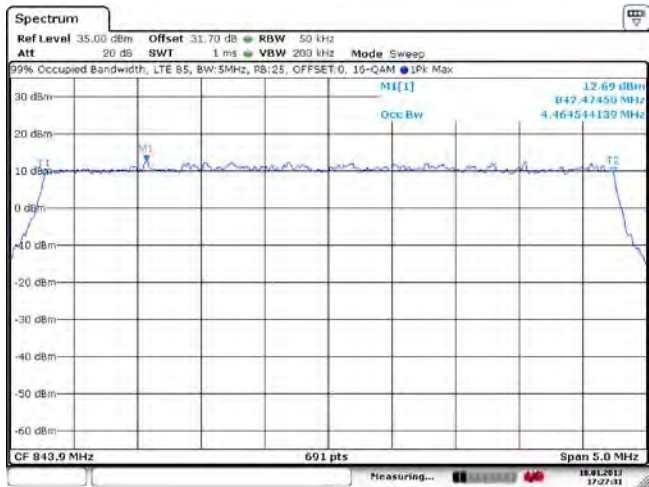
**Figure 4-21a: Occupied Bandwidth, Band 5 High Channel, 10MHz BW, RB=50**



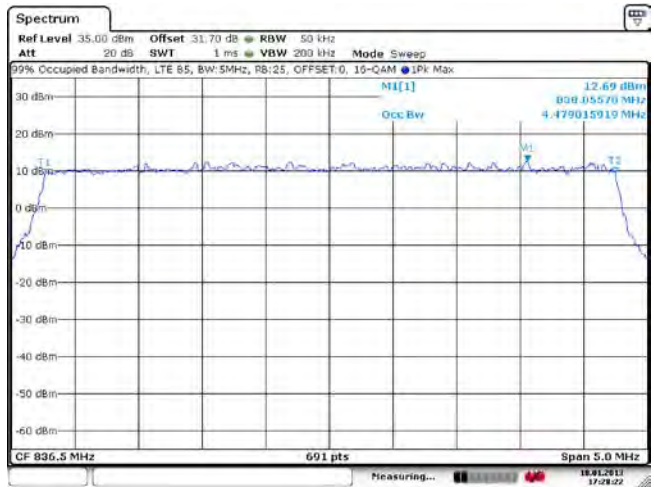
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

LTE Band 5 Conducted RF Emission Test Data cont'd

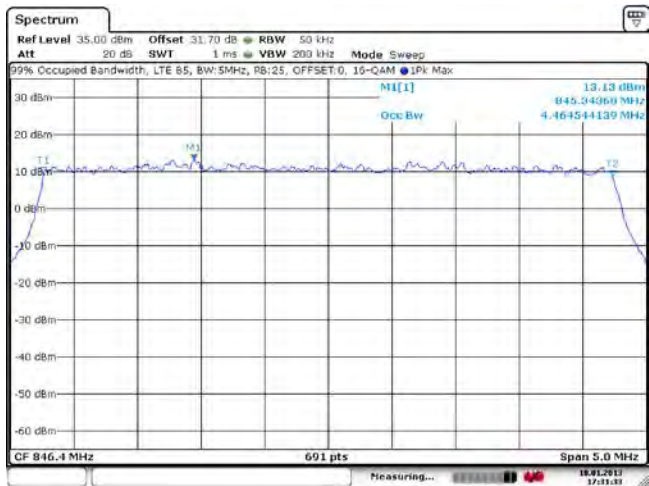
**Figure 4-22a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=25**




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



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



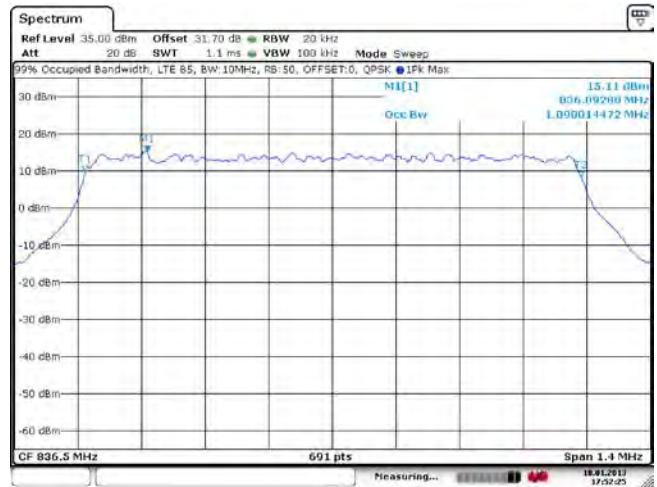
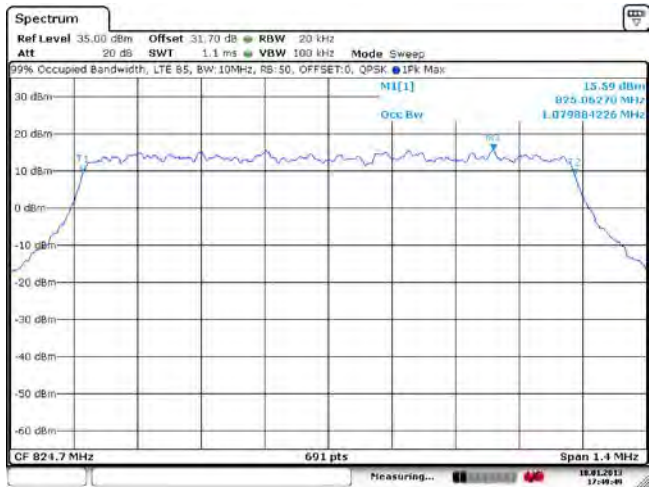


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

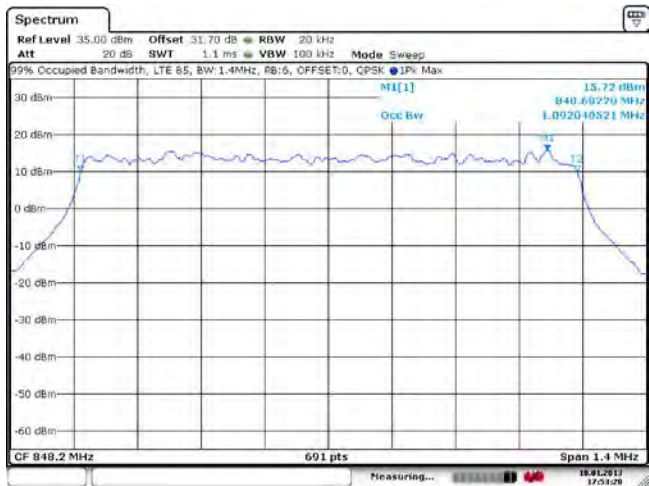
LTE Band 5 Conducted RF Emission Test Data cont'd


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

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



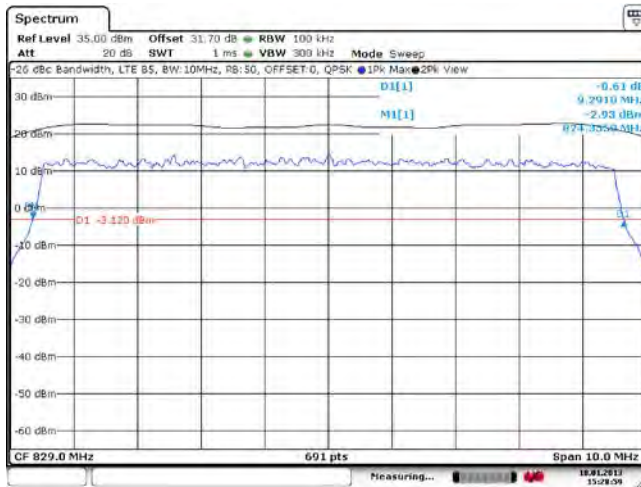
**Figure 4-27a: Occupied Bandwidth, Band 5 High Channel, 1.4MHz BW, RB=6**



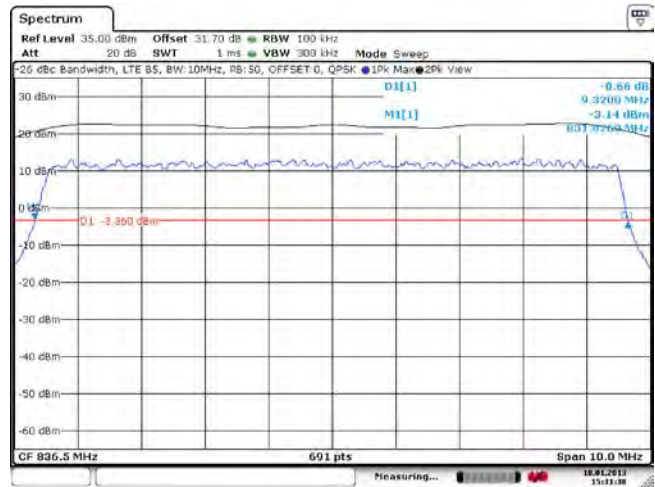
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

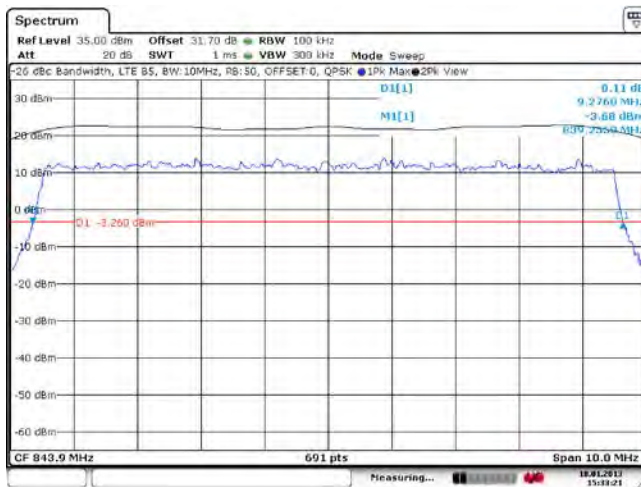
**Figure 4-28a: -26 dBc Bandwidth, Band 5 Low Channel, 10MHz BW, RB=50**



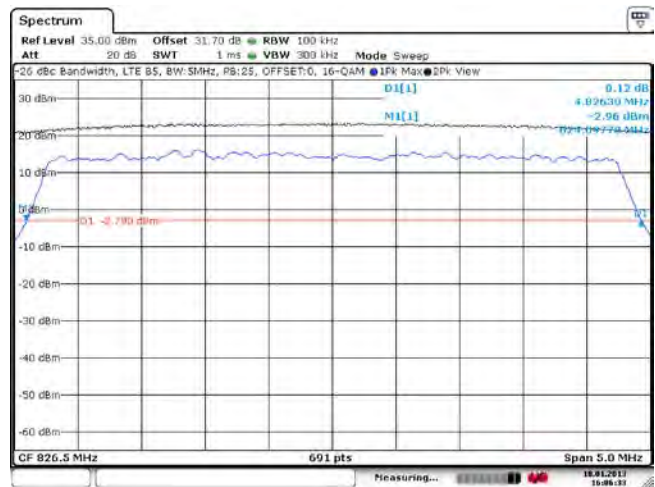
**Figure 4-29a: -26 dBc Bandwidth, Band 5 Middle Channel, 10MHz BW, RB=50**



**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**



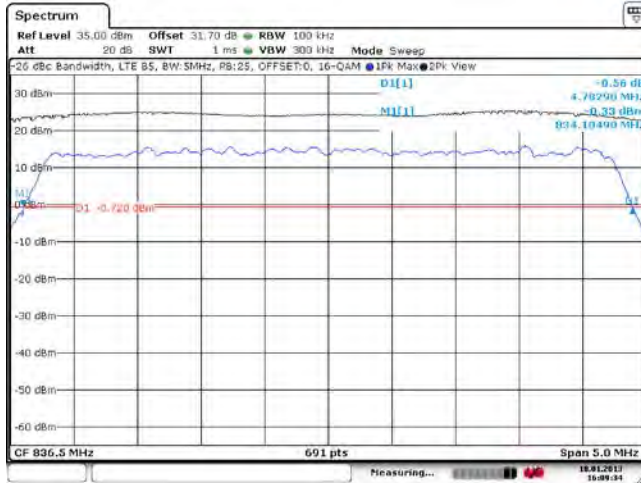
Test Report No.:  
 RTS-6026-1302-12\_Rev1

Dates of Test:  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

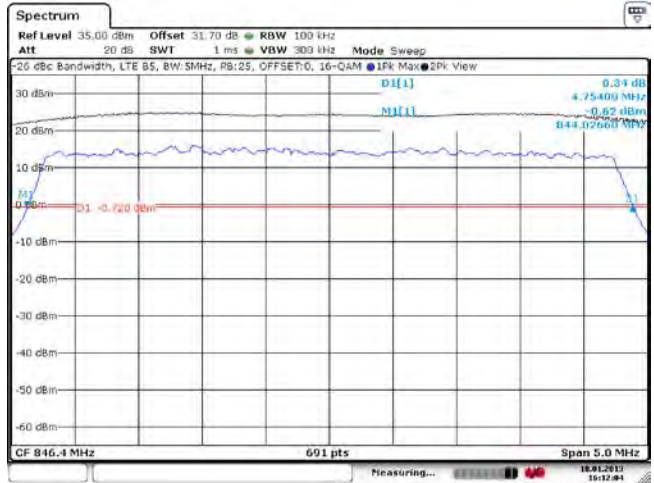
FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

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

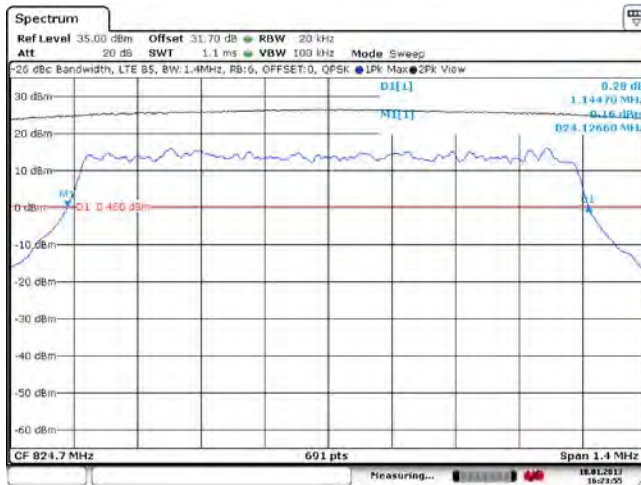
**Figure 4-32a: -26 dBc Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=25**



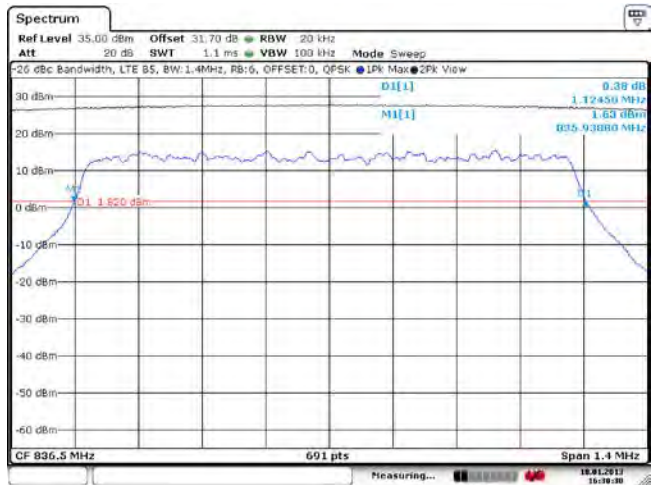
**Figure 4-33a: -26 dBc Bandwidth, Band 5 High Channel, 5MHz BW, RB=25**




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



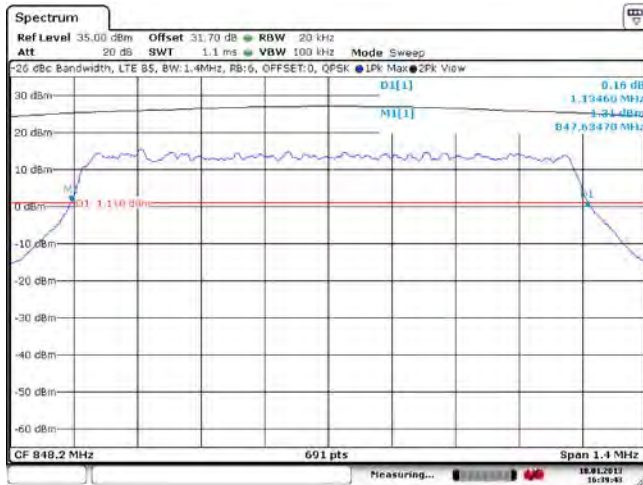
**Figure 4-35a: -26 dBc Bandwidth, Band 5 Middle Channel, 1.4MHz BW, RB=6**



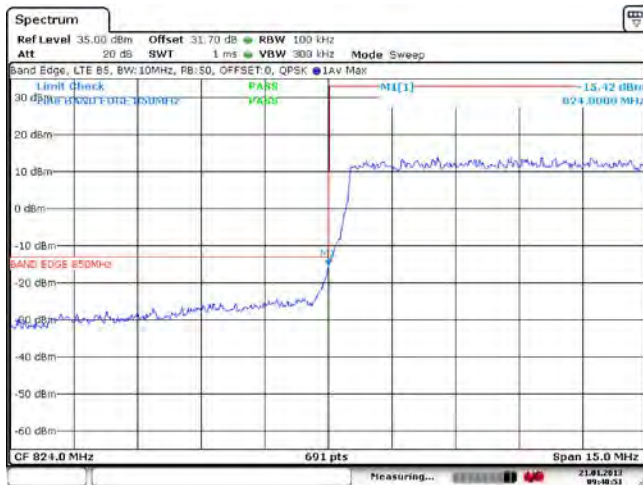
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

LTE Band 5 Conducted RF Emission Test Data cont'd

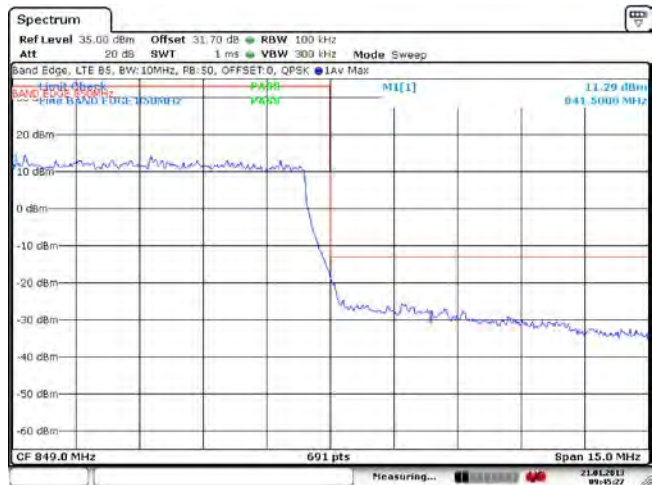
**Figure 4-36a: -26 dBc Bandwidth, Band 5 High Channel, 1.4MHz BW, RB=6**




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



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

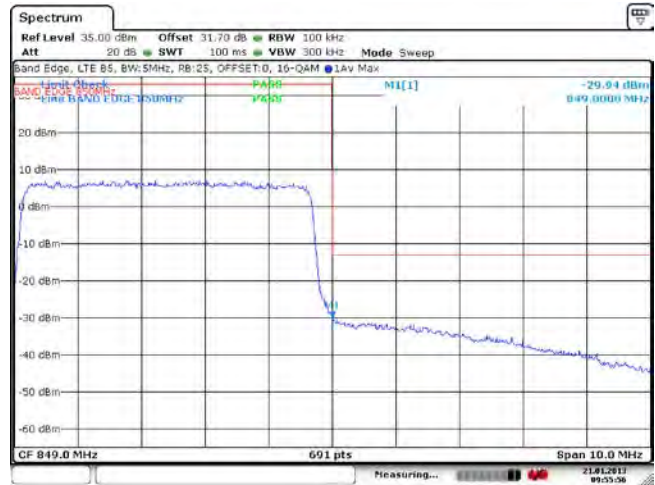
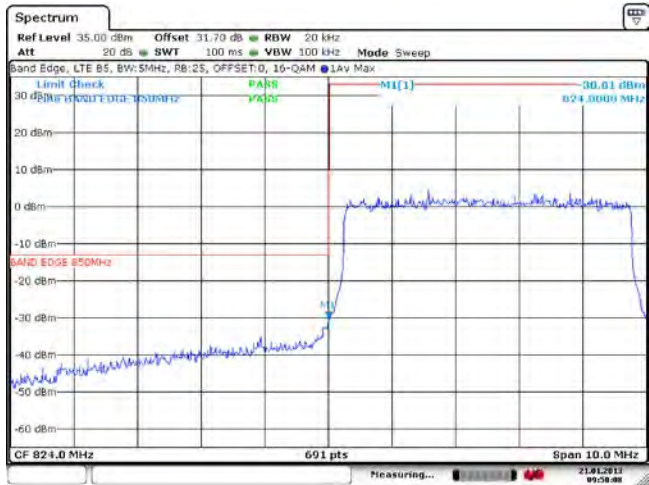


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

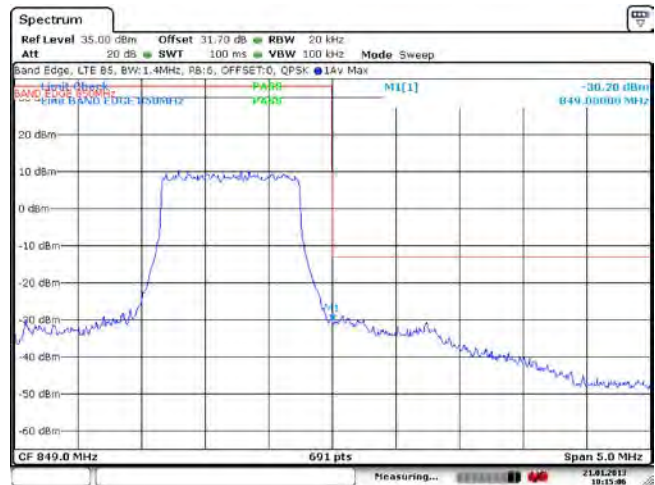
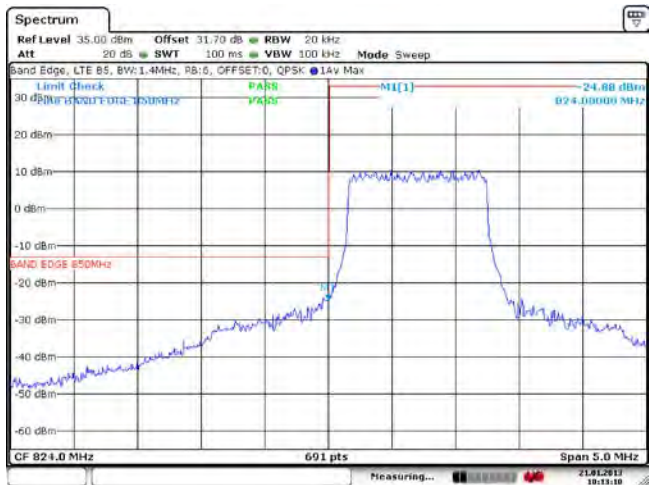
**Figure 4-39a: Band 5 Low Channel Mask, 5MHz BW, RB=25**


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



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

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

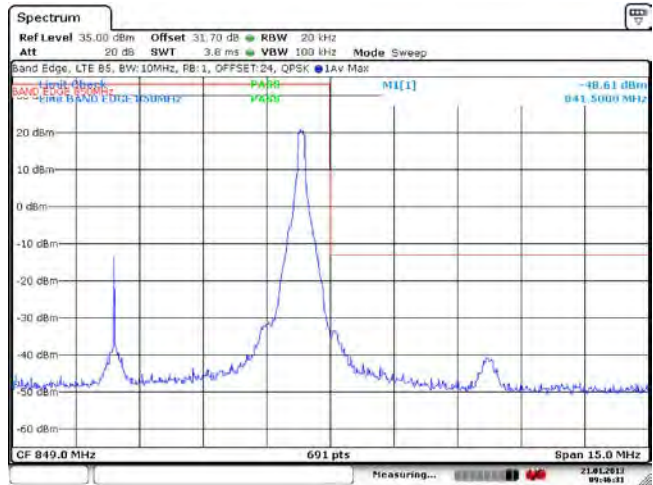
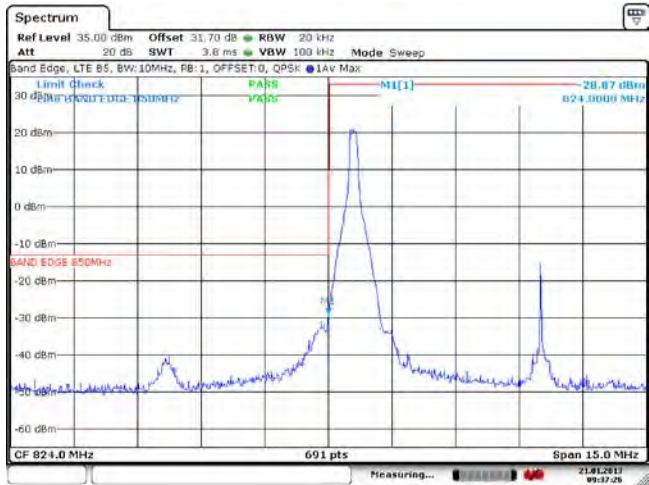



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

LTE Band 5 Conducted RF Emission Test Data cont'd

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

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

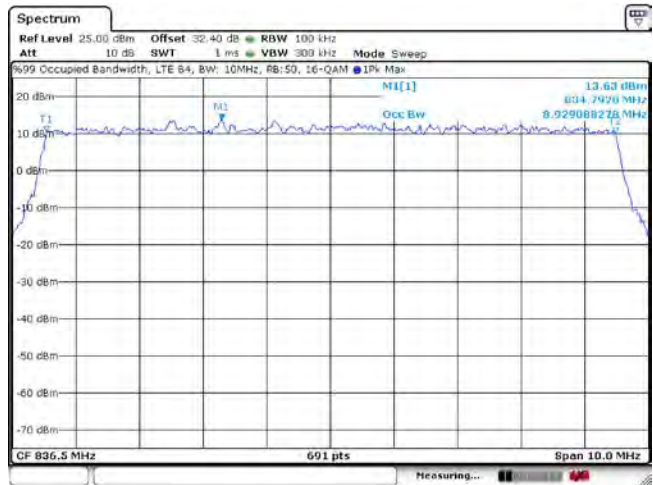
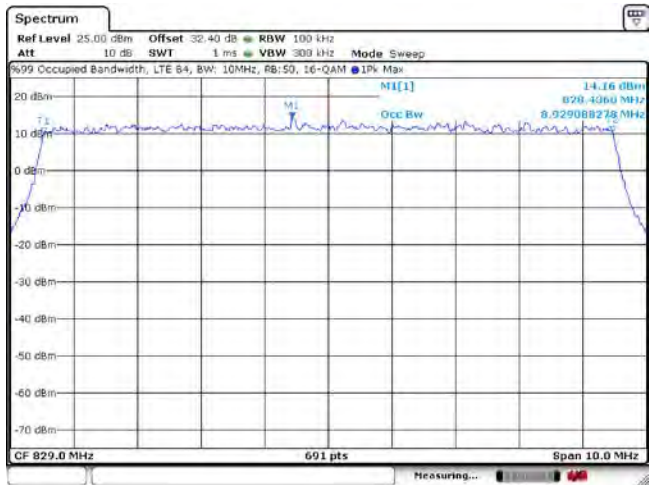


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 4A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

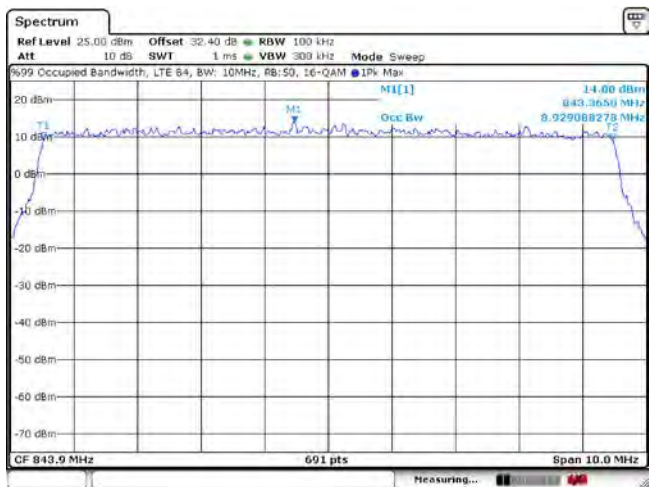
LTE Band 5 Conducted RF Emission Test Data cont'd

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

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




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

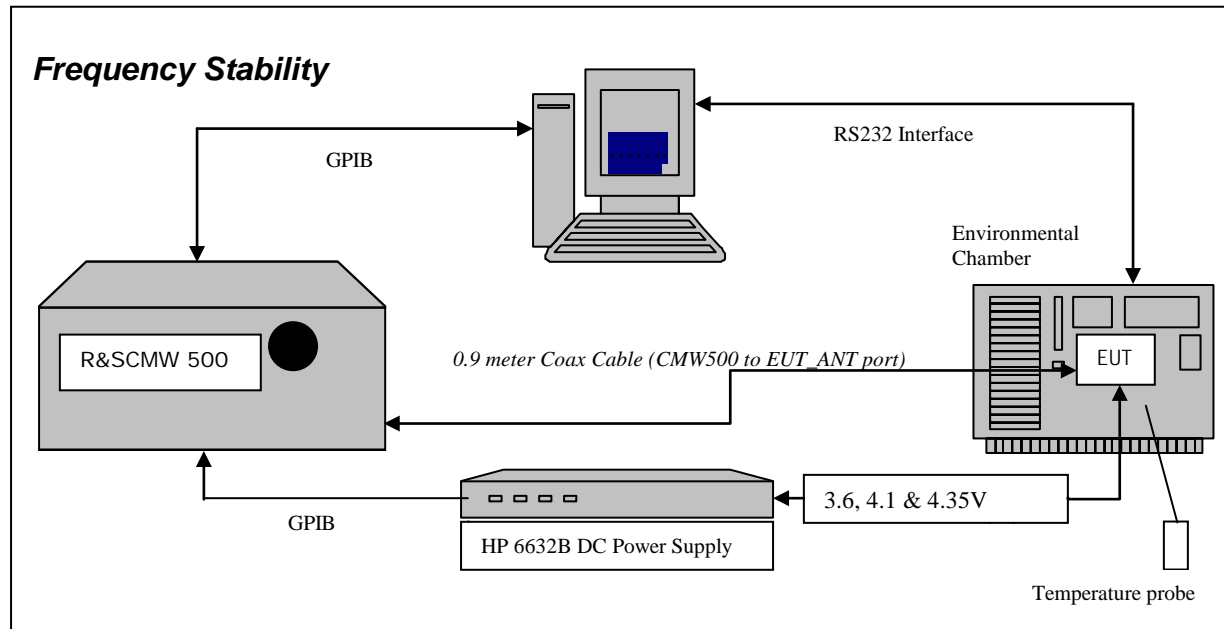


## APPENDIX 4B – LTE Band 5 FREQUENCY STABILITY TEST DATA



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### LTE Band 5 Frequency Stability Test Data



The following measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

**2.1055** Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation


(d) Frequency Stability - Voltage Variation

**24.237** *Frequency Stability.*

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

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

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

## Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.


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

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMW 500 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

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

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 829.0 MHz, 836.5 MHz and 844.0 MHz each was measured under 10 MHz bandwidth with maximum (50) resource blocks. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.

After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW


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 **0.0201 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

Date of test: January 21, 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	10.56	0.0127
20525	836.5	3.6	20	11.32	0.0135
20600	844.0	3.6	20	5.46	0.0065

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	20	6.53	0.0079
20525	836.5	4.1	20	1.76	0.0021
20600	844.0	4.1	20	8.86	0.0105

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	20	13.65	0.0165
20525	836.5	4.35	20	10.39	0.0124
20600	844.0	4.35	20	10.33	0.0122

Test Report No.:  
 RTS-6026-1302-12\_Rev1

Dates of Test:  
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 March 04 and April 05, 2013

FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**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	0.44	0.0005
20450	829.0	3.6	-20	-0.10	-0.0001
20450	829.0	3.6	-10	-1.77	-0.0021
20450	829.0	3.6	0	4.87	0.0059
20450	829.0	3.6	10	12.57	0.0152
20450	829.0	3.6	20	10.56	0.0127
20450	829.0	3.6	30	6.01	0.0073
20450	829.0	3.6	40	-0.35	-0.0004
20450	829.0	3.6	50	<b>16.67</b>	<b>0.0201</b>
20450	829.0	3.6	60	1.42	0.0017
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.1	-30	2.59	0.0031
20450	829.0	4.1	-20	2.08	0.0025
20450	829.0	4.1	-10	2.28	0.0027
20450	829.0	4.1	0	4.62	0.0056
20450	829.0	4.1	10	11.56	0.0139
20450	829.0	4.1	20	6.53	0.0079
20450	829.0	4.1	30	6.89	0.0083
20450	829.0	4.1	40	0.78	0.0009
20450	829.0	4.1	50	9.03	0.0109
20450	829.0	4.1	60	2.89	0.0035
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20450	829.0	4.35	-30	0.58	0.0007
20450	829.0	4.35	-20	-0.28	-0.0003
20450	829.0	4.35	-10	3.14	0.0038
20450	829.0	4.35	0	1.34	0.0016
20450	829.0	4.35	10	10.71	0.0129
20450	829.0	4.35	20	13.65	0.0165
20450	829.0	4.35	30	14.60	0.0176
20450	829.0	4.35	40	2.06	0.0025
20450	829.0	4.35	50	3.70	0.0045
20450	829.0	4.35	60	2.49	0.0030

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FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**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	12.45	0.0149
20525	836.5	3.6	-20	1.52	0.0018
20525	836.5	3.6	-10	9.83	0.0117
20525	836.5	3.6	0	11.66	0.0139
20525	836.5	3.6	10	-1.65	-0.0020
20525	836.5	3.6	20	11.32	0.0135
20525	836.5	3.6	30	1.55	0.0019
20525	836.5	3.6	40	10.23	0.0122
20525	836.5	3.6	50	13.46	0.0161
20525	836.5	3.6	60	12.66	0.0151
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.1	-30	9.81	0.0117
20525	836.5	4.1	-20	8.91	0.0107
20525	836.5	4.1	-10	13.00	0.0155
20525	836.5	4.1	0	8.74	0.0105
20525	836.5	4.1	10	-1.14	-0.0014
20525	836.5	4.1	20	1.76	0.0021
20525	836.5	4.1	30	3.63	0.0043
20525	836.5	4.1	40	8.31	0.0099
20525	836.5	4.1	50	11.70	0.0140
20525	836.5	4.1	60	-4.74	-0.0057
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20525	836.5	4.35	-30	6.24	0.0075
20525	836.5	4.35	-20	7.19	0.0086
20525	836.5	4.35	-10	8.25	0.0099
20525	836.5	4.35	0	8.22	0.0098
20525	836.5	4.35	10	2.39	0.0029
20525	836.5	4.35	20	10.39	0.0124
20525	836.5	4.35	30	9.97	0.0119
20525	836.5	4.35	40	10.57	0.0126
20525	836.5	4.35	50	8.87	0.0106
20525	836.5	4.35	60	9.55	0.0114

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**Dates of Test:**  
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**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

**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	8.79	0.0104
20600	844.0	3.6	-20	10.43	0.0124
20600	844.0	3.6	-10	6.16	0.0073
20600	844.0	3.6	0	9.43	0.0112
20600	844.0	3.6	10	0.16	0.0002
20600	844.0	3.6	20	5.46	0.0065
20600	844.0	3.6	30	8.07	0.0096
20600	844.0	3.6	40	8.88	0.0105
20600	844.0	3.6	50	11.96	0.0142
20600	844.0	3.6	60	10.90	0.0129
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.1	-30	7.53	0.0089
20600	844.0	4.1	-20	10.30	0.0122
20600	844.0	4.1	-10	6.16	0.0073
20600	844.0	4.1	0	9.99	0.0118
20600	844.0	4.1	10	6.44	0.0076
20600	844.0	4.1	20	8.86	0.0105
20600	844.0	4.1	30	5.00	0.0059
20600	844.0	4.1	40	0.98	0.0012
20600	844.0	4.1	50	6.38	0.0076
20600	844.0	4.1	60	9.80	0.0116
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20600	844.0	4.35	-30	11.11	0.0132
20600	844.0	4.35	-20	11.24	0.0133
20600	844.0	4.35	-10	3.42	0.0040
20600	844.0	4.35	0	9.55	0.0113
20600	844.0	4.35	10	10.54	0.0125
20600	844.0	4.35	20	10.33	0.0122
20600	844.0	4.35	30	7.89	0.0094
20600	844.0	4.35	40	12.36	0.0146
20600	844.0	4.35	50	8.63	0.0102
20600	844.0	4.35	60	12.02	0.0142

## APPENDIX 4C – LTE Band 5 RADIATED EMISSIONS TEST DATA



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 4C</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### Radiated Power Test Data Results

Date of Test: December 19, 2012

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 25.0 °C  
Relative Humidity: 29.5 %

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

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

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

#### **LTE band 5, 10MHz BW, RB=1, QPSK modulation**

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	20500	834.00	5	Dipole	V	-39.98	-28.85	V-V	6.26	<b>23.28</b>	<b>0.21</b>	38.50	-15.22
F0	20500	834.00	5	Dipole	H	-28.85		H-H	4.87				
F0	20525	836.50	5	Dipole	V	-40.03	-29.15	V-V	5.87	22.76	0.19	38.50	-15.74
F0	20525	836.50	5	Dipole	H	-29.15		H-H	4.74				
F0	20549	838.90	5	Dipole	V	-39.99	-29.36	V-V	5.75	22.64	0.18	38.50	-15.86
F0	20549	838.90	5	Dipole	H	-29.36		H-H	4.90				

#### **LTE band 5, 10MHz BW, RB=1, 16-QAM modulation**


								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	20500	834.00	5	Dipole	V	-41.15	-30.83	V-V	3.80	20.82	0.12	38.50	-17.68
F0	20500	834.00	5	Dipole	H	-30.83		H-H	3.30				
F0	20525	836.50	5	Dipole	V	-41.34	-30.43	V-V	4.58	<b>21.47</b>	<b>0.14</b>	38.50	-17.03
F0	20525	836.50	5	Dipole	H	-30.43		H-H	3.43				
F0	20549	838.90	5	Dipole	V	-41.20	-31.87	V-V	3.78	20.67	0.12	38.50	-17.83
F0	20549	838.90	5	Dipole	H	-31.87		H-H	2.24				

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



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

### 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	1M09D7W	LTE B4	1.4	16QAM
1711.5-1753.5	23.80	2M68G7D	LTE B4	3	QPSK
1711.5-1753.5	22.55	2M68D7W	LTE B4	3	16QAM
1712.5-1752.5	23.85	4M50G7D	LTE B4	5	QPSK
1712.5-1752.5	23.05	4M50D7W	LTE B4	5	16QAM
1715-1750	23.71	8M92G7D	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 18.64 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.

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	<b>APPENDIX 5A</b>	
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**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	18.64	17.86	17.91
1732.5	18.63	17.80	17.80
1745.0	18.56	17.84	17.92

**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 9.03 dB in 20MHz bandwidth with 50 resource blocks.


**Measurement Plots for LTE Band 4**

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

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

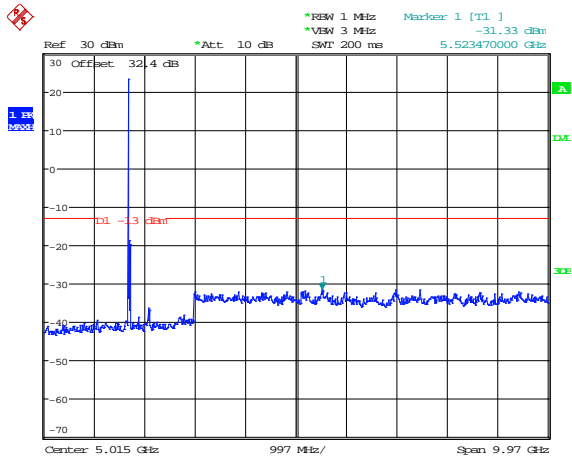
See Figures 5-35a to 5-44a for the plots of the Channel mask.

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

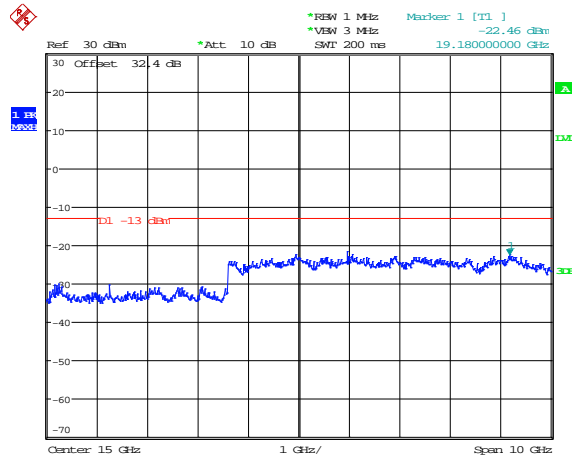
### LTE Band 4 Conducted RF Emission Test Data cont'd

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



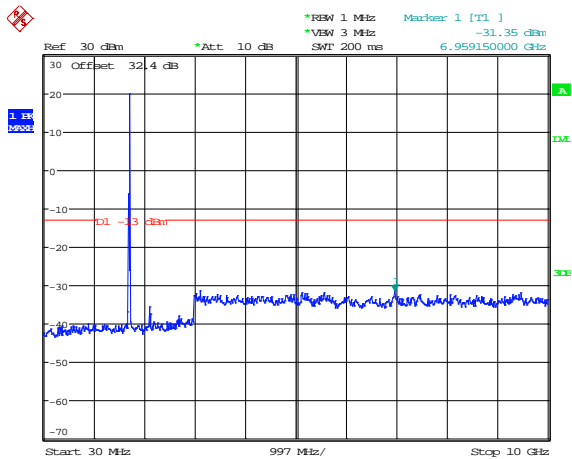
Date: 4.JAN.2013 15:13:14

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



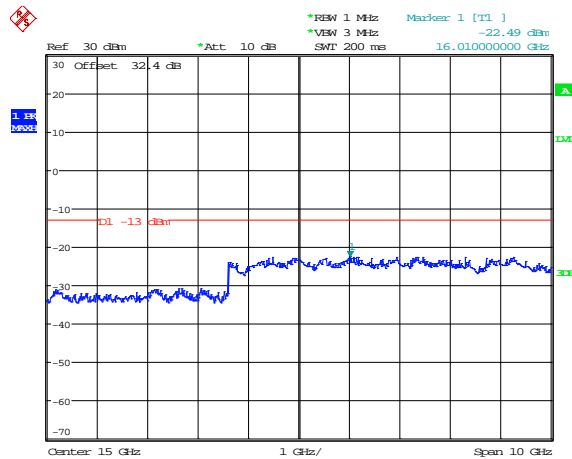
Date: 4.JAN.2013 15:20:49

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




Date: 4.JAN.2013 15:14:32

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

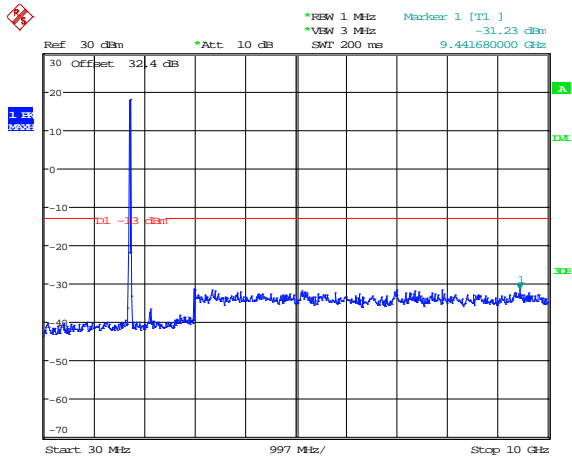


Date: 4.JAN.2013 15:20:10

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

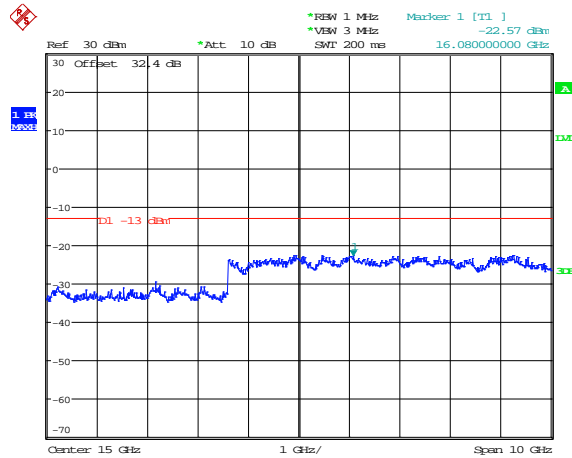
### LTE Band 4 Conducted RF Emission Test Data cont'd

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



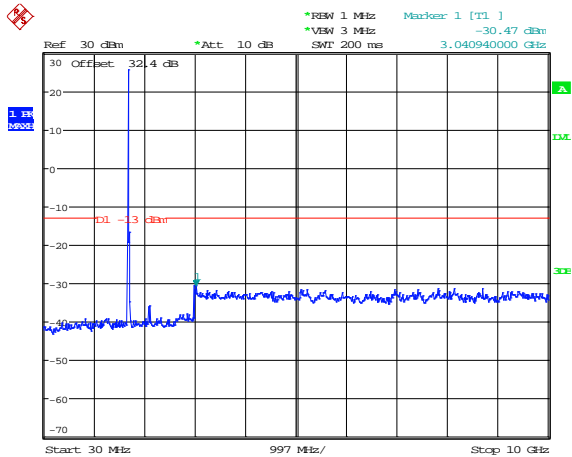
Date: 4.JAN.2013 15:15:09

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



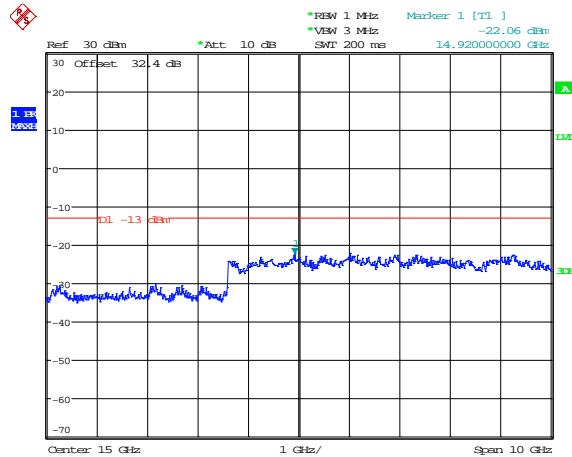
Date: 4.JAN.2013 15:15:54

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




Date: 4.JAN.2013 15:29:24

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



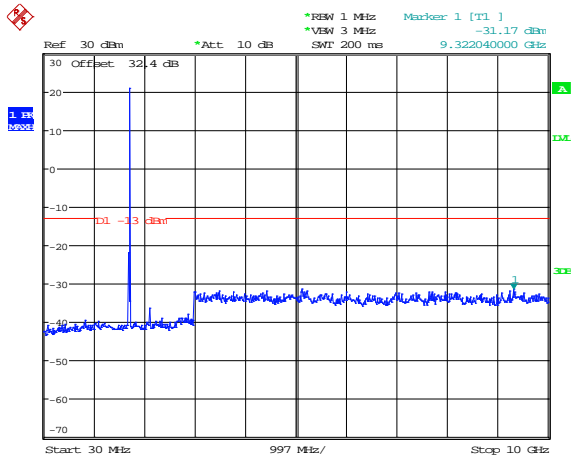
Date: 4.JAN.2013 15:21:28



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

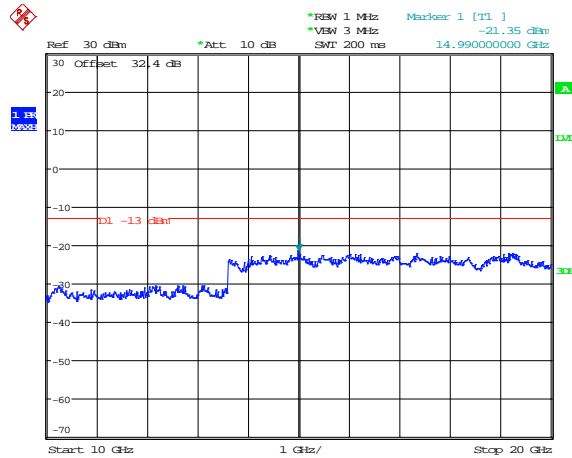
## LTE Band 4 Conducted RF Emission Test Data cont'd

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



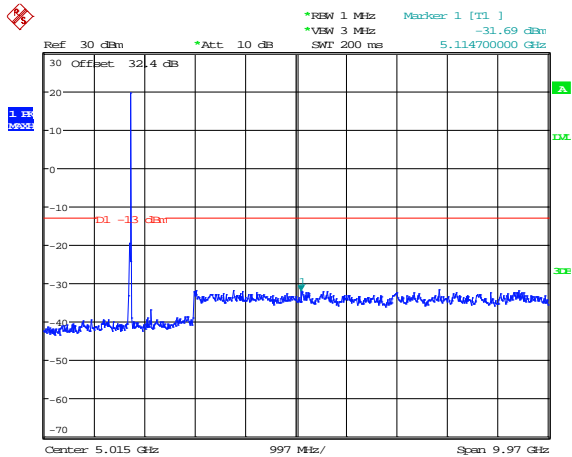
Date: 4.JAN.2013 15:32:35

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



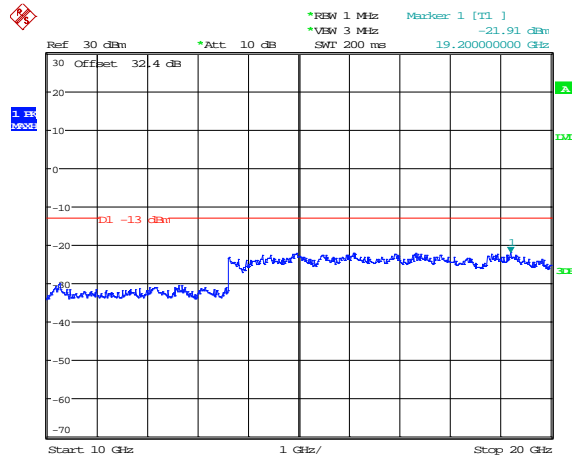
Date: 4.JAN.2013 15:22:25

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




Date: 4.JAN.2013 15:33:26

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

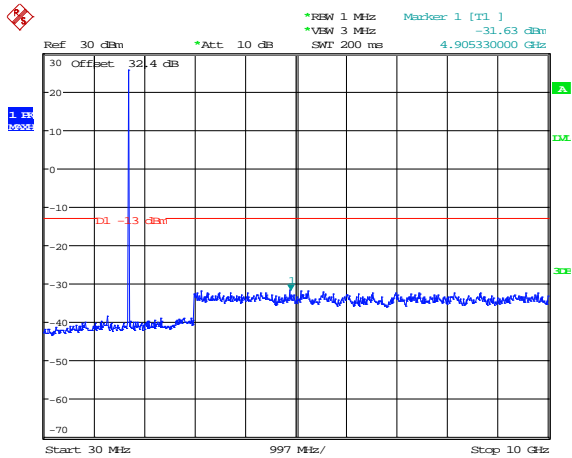


Date: 4.JAN.2013 15:23:41

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

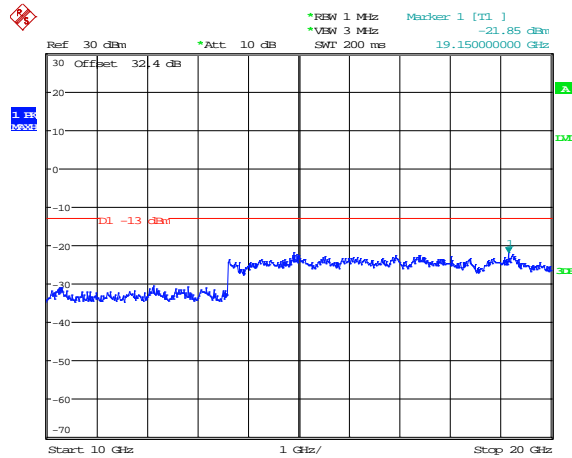
### LTE Band 4 Conducted RF Emission Test Data cont'd

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



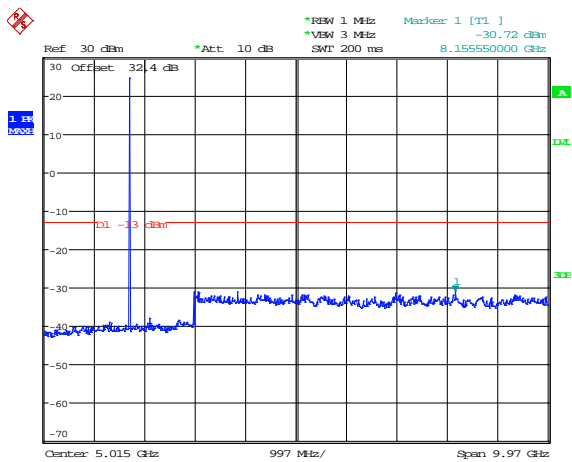
Date: 4.JAN.2013 15:34:38

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



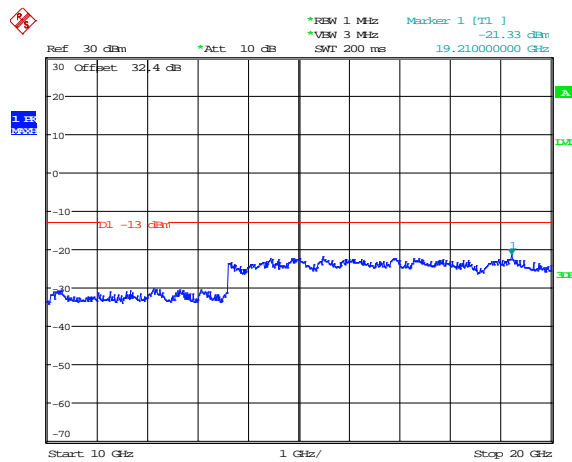
Date: 4.JAN.2013 15:46:28

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




Date: 4.JAN.2013 15:43:20

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

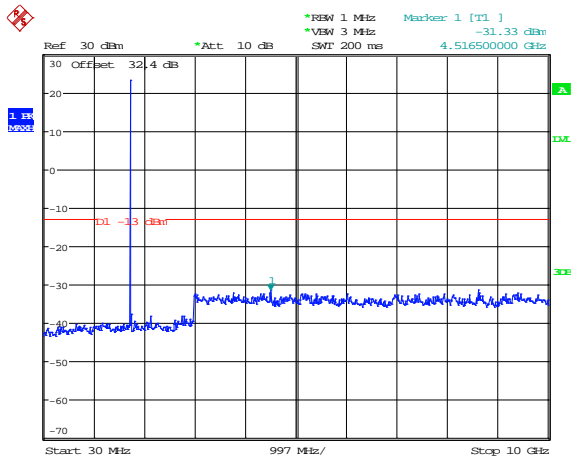


Date: 4.JAN.2013 15:45:58

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

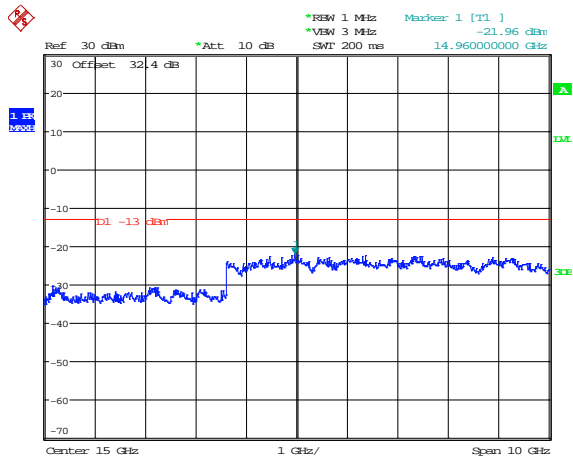
### LTE Band 4 Conducted RF Emission Test Data cont'd

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




Date: 4.JAN.2013 15:43:54

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



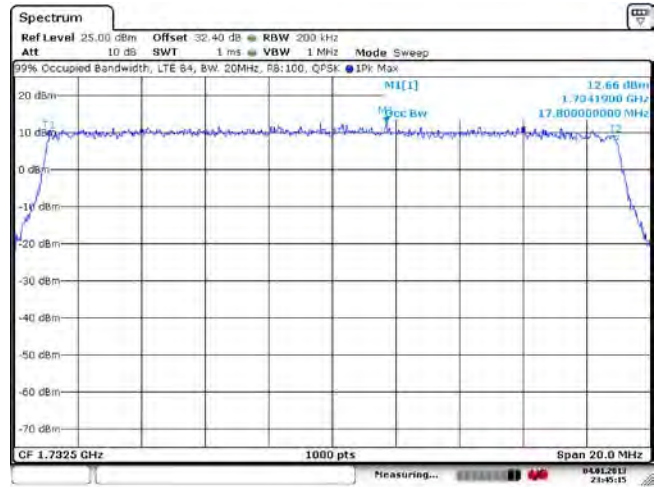
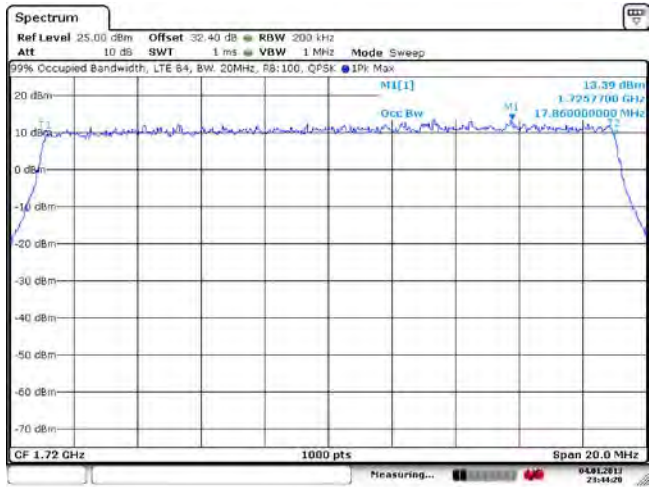
Date: 4.JAN.2013 15:44:28

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

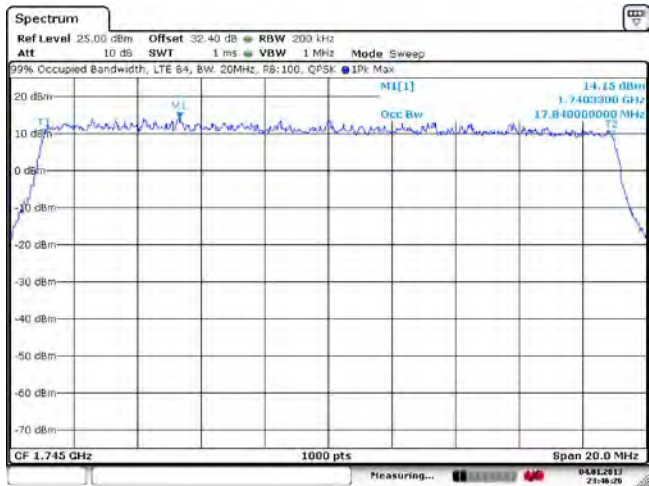
**LTE Band 4 Conducted RF Emission Test Data cont'd**


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

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



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

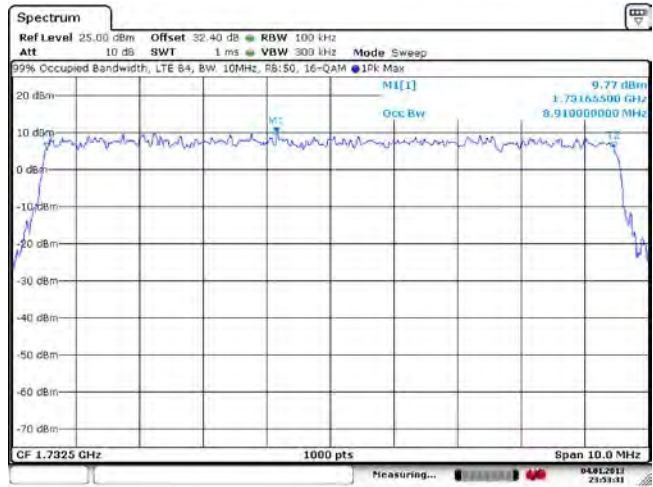
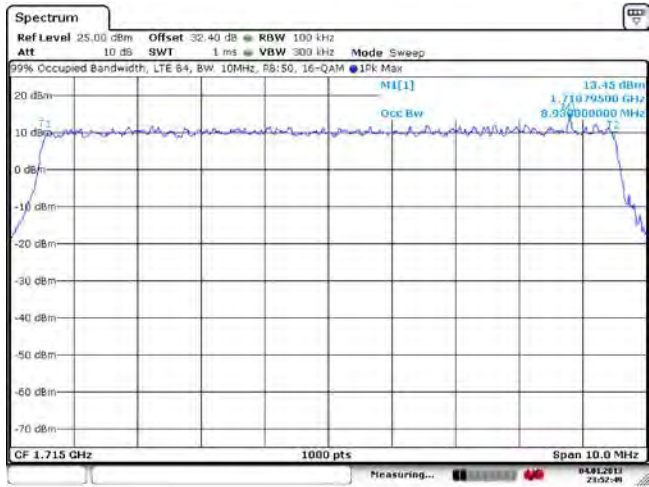


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

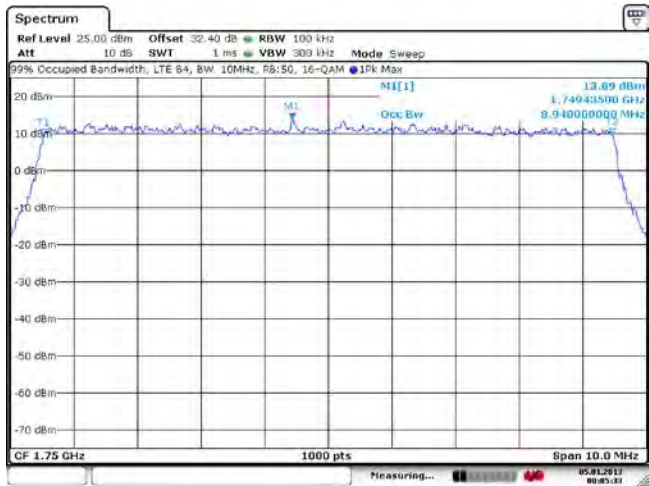
LTE Band 4 Conducted RF Emission Test Data cont'd


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

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



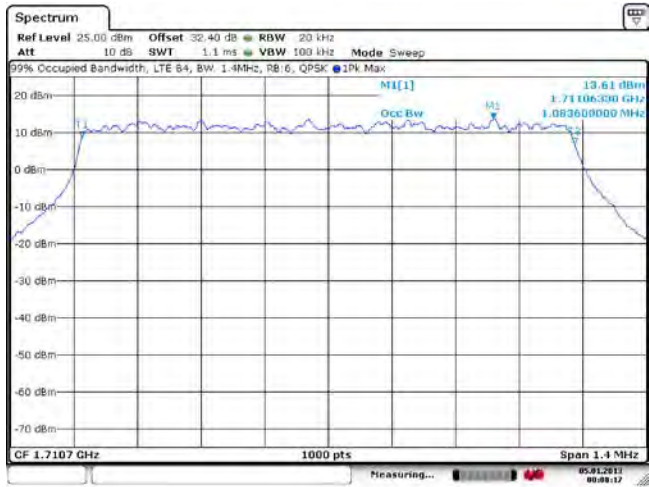
**Figure 5-24a: Occupied Bandwidth, Band 4 High Channel, 10MHz BW, RB=50**



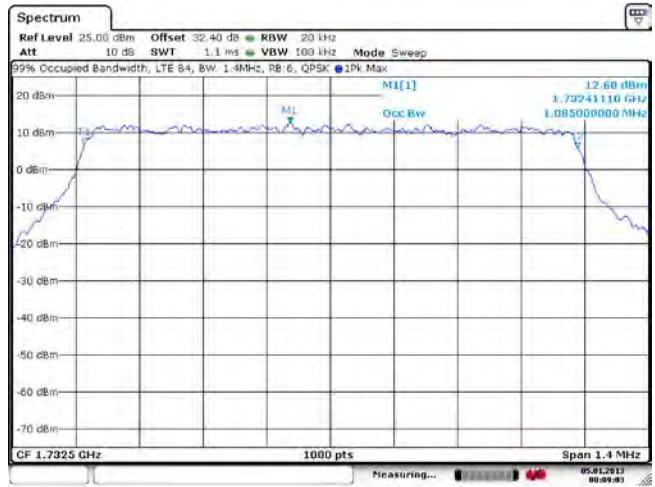
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

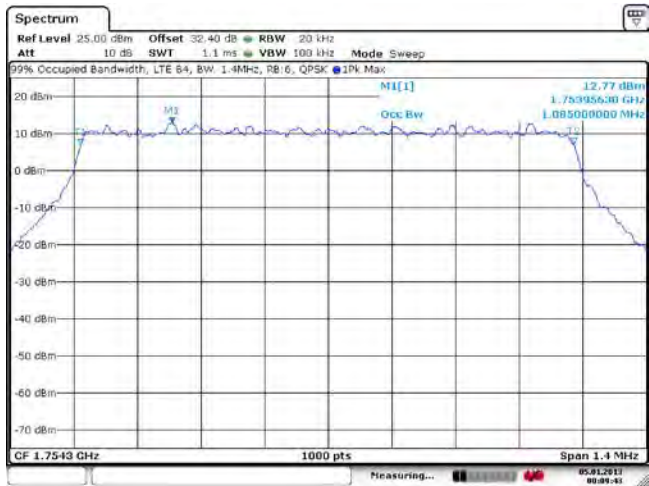
**Figure 5-25a: Occupied Bandwidth, Band 4 Low Channel, 1.4MHz BW, RB=6**




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



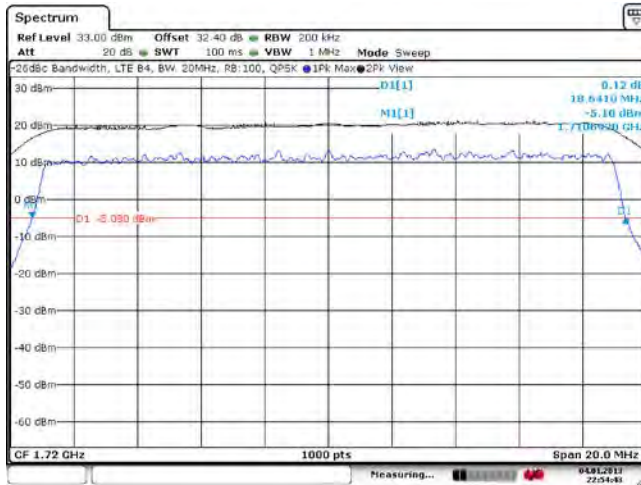
**Figure 5-27a: Occupied Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6**



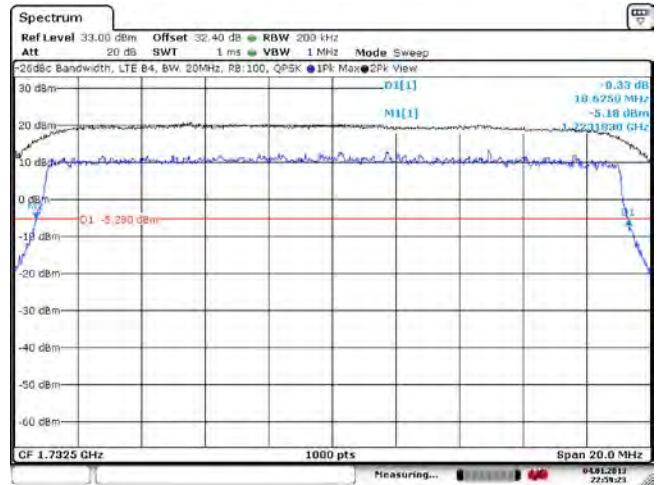
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

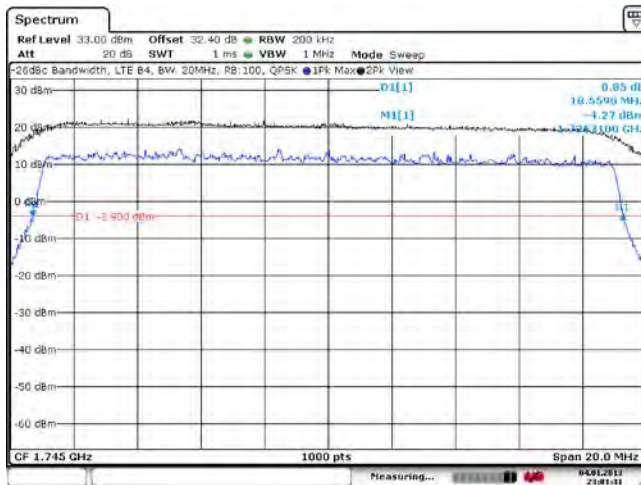
**Figure 5-28a: -26 dBc Bandwidth, Band 4 Low Channel, 20MHz BW, RB=100**



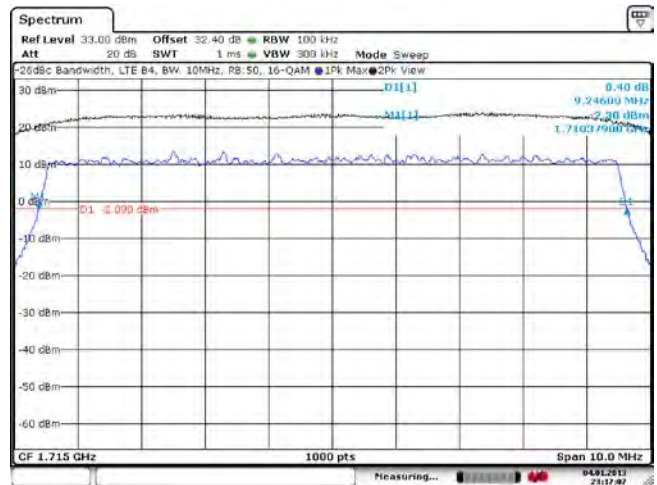
**Figure 5-29a: -26 dBc Bandwidth, Band 4 Middle Channel, 20MHz BW, RB=100**




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



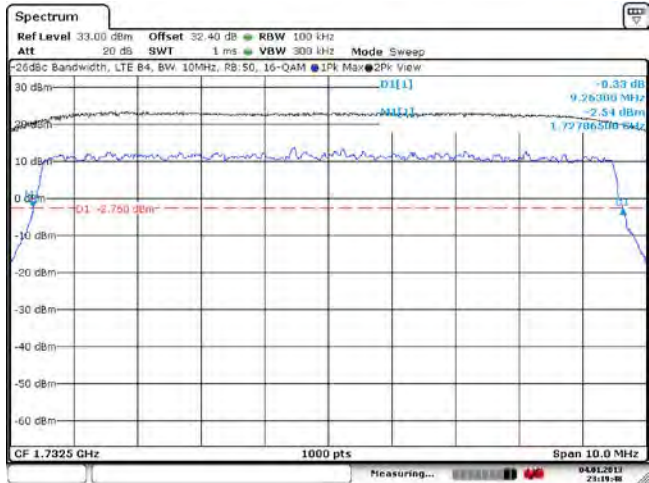
**Figure 5-31a: -26 dBc Bandwidth, Band 4 Low Channel, 10MHz BW, RB=50**



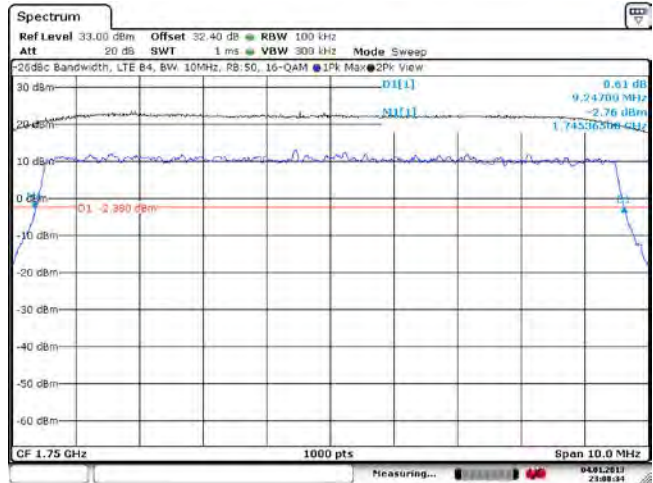
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

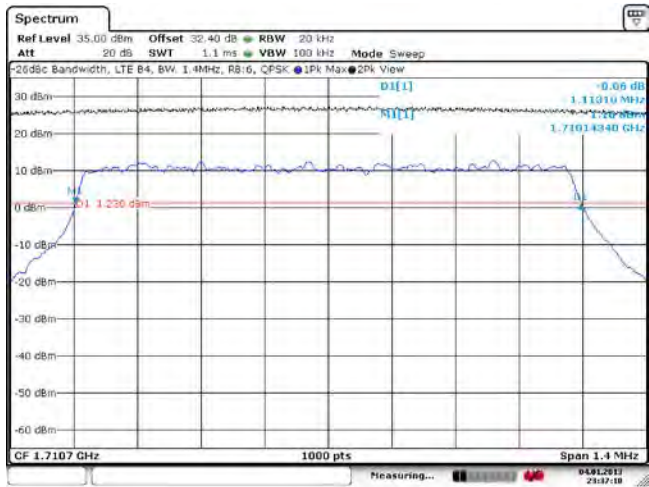
**Figure 5-32a: -26 dBc Bandwidth, Band 4 Middle Channel, 10MHz BW, RB=50**



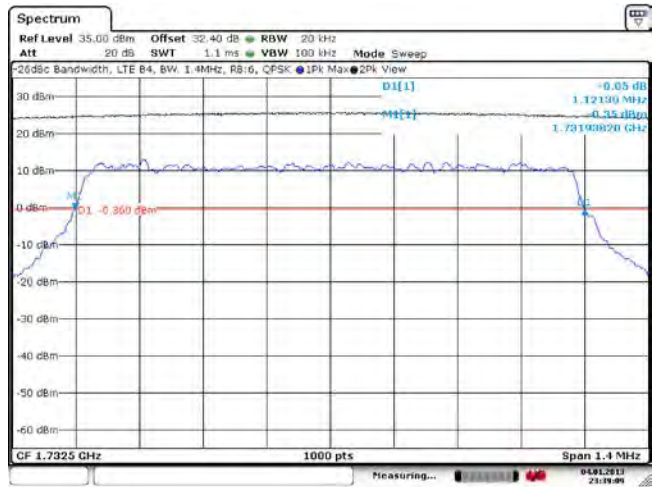
**Figure 5-33a: -26 dBc Bandwidth, Band 4 High Channel, 10MHz BW, RB=50**




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



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

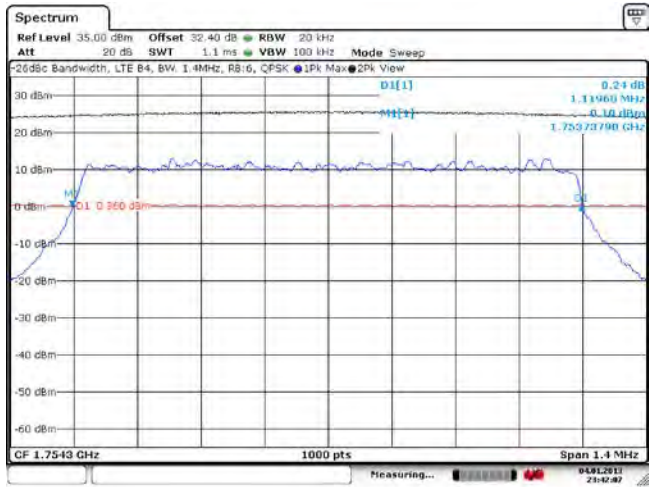




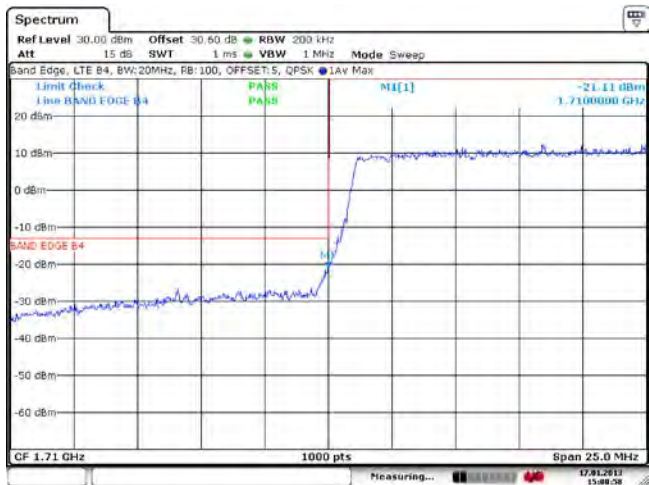
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

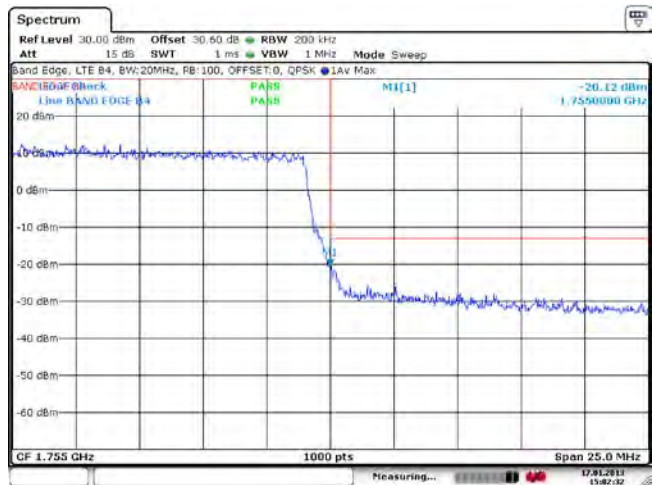
**Figure 5-36a: -26 dBc Bandwidth, Band 4 High Channel, 1.4MHz BW, RB=6**




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



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

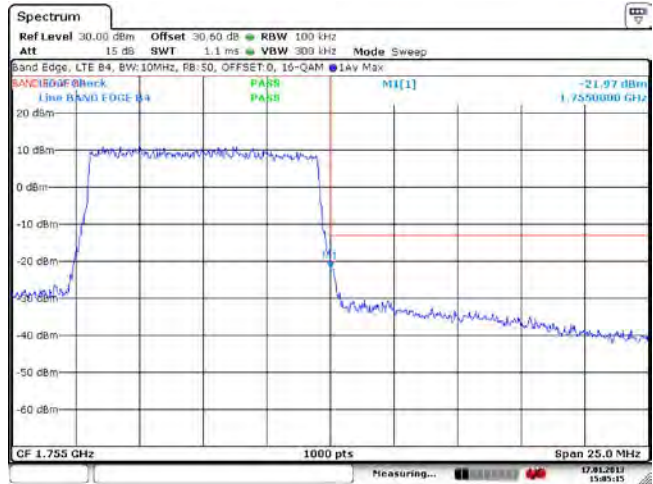
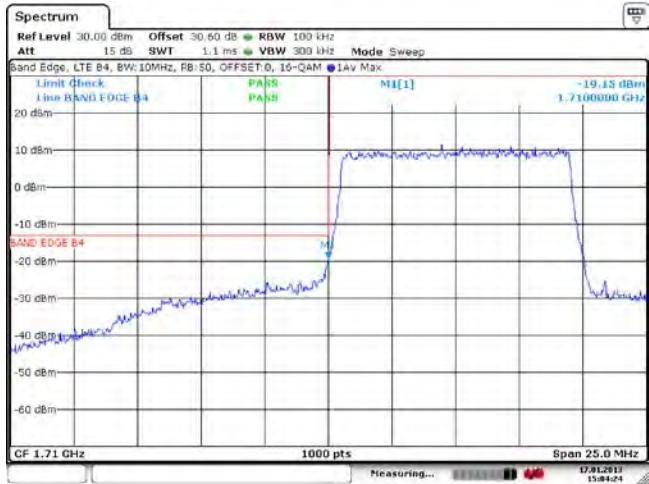


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<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

LTE Band 4 Conducted RF Emission Test Data cont'd

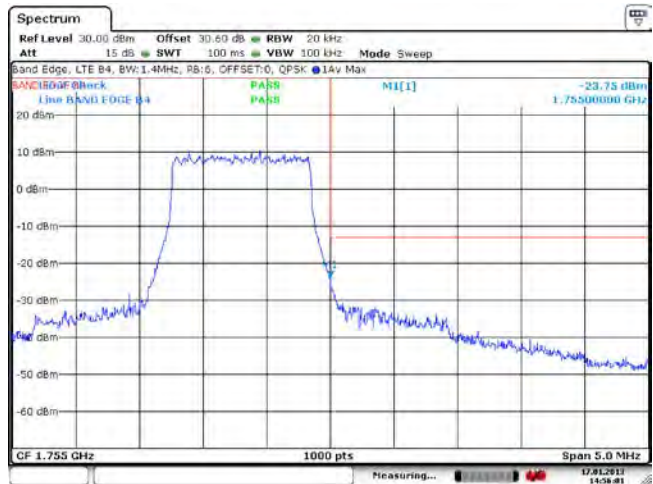
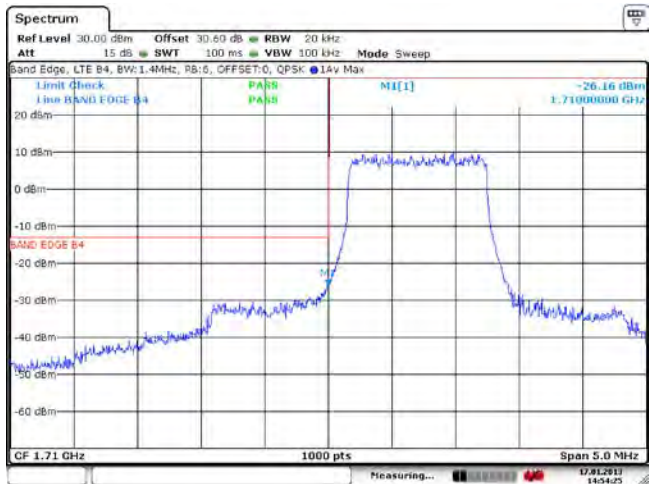
**Figure 5-39a: Band 4 Low Channel Mask, 10MHz BW, RB=50**

**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**



**Test Report No.:**  
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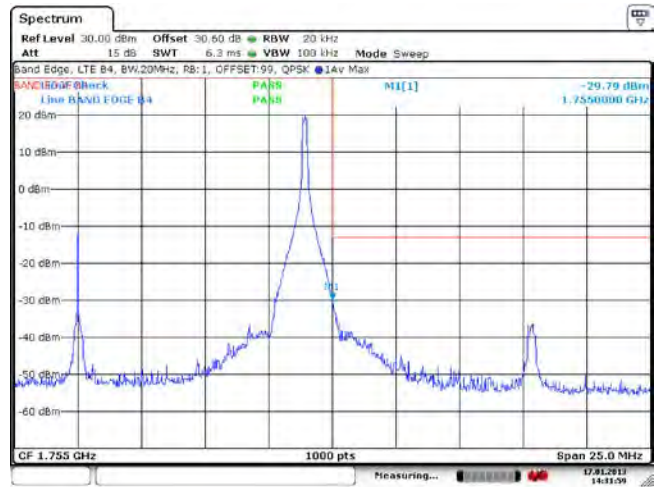
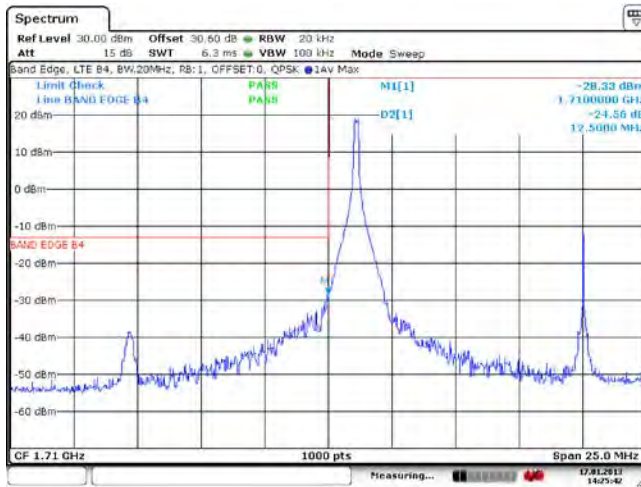
**Dates of Test:**  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

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

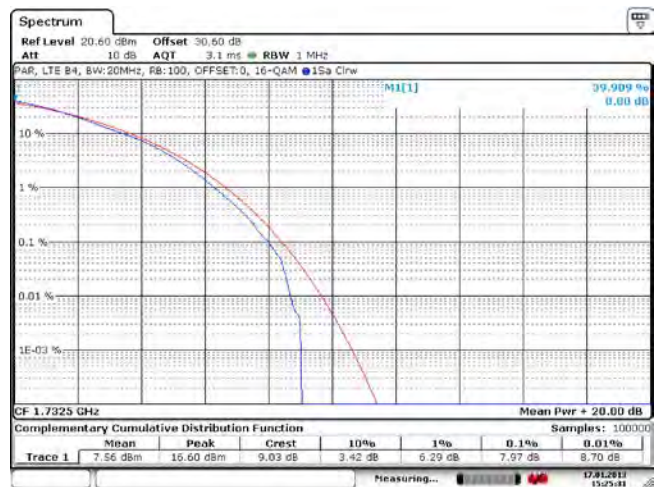
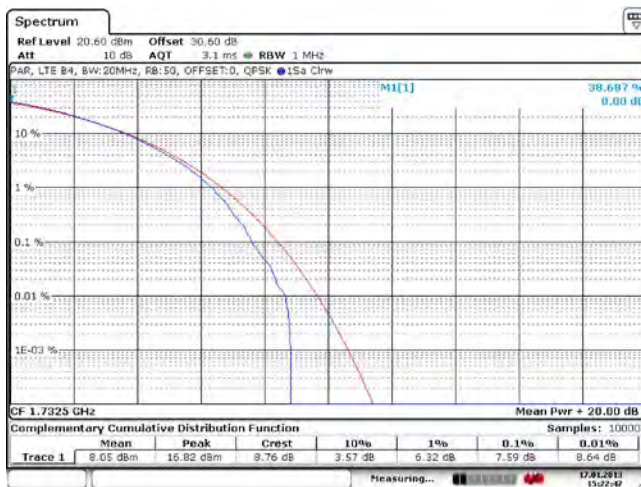
**Figure 5-43a: Band 4 Low Channel Mask, 20MHz BW, RB=1**


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



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

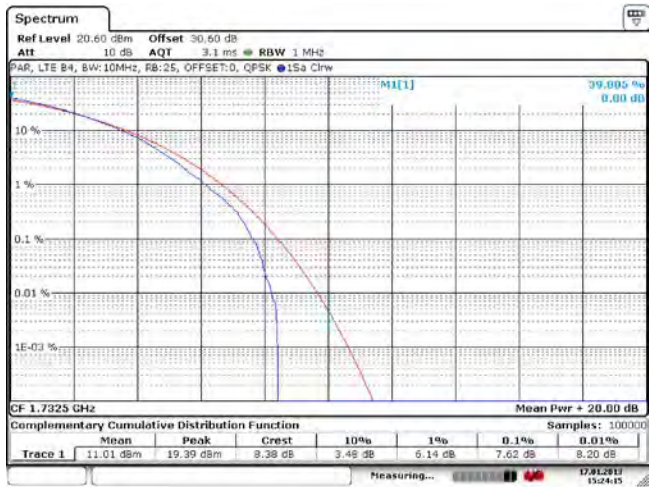
**Figure 5-46a: Band 4 Middle Channel Mask, 20MHz BW, RB=100, 16-QAM**



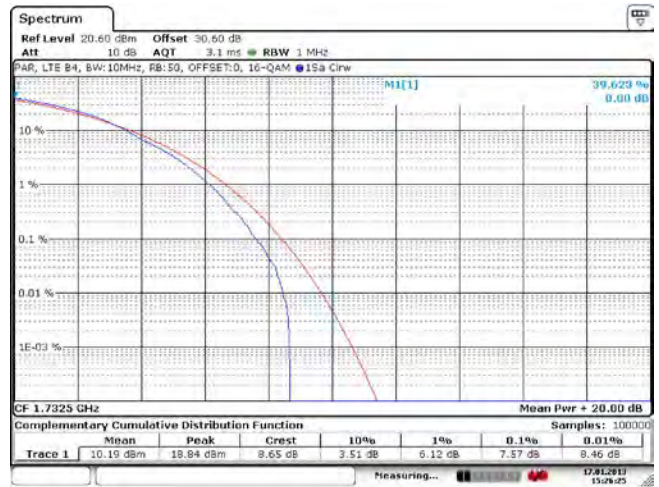
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

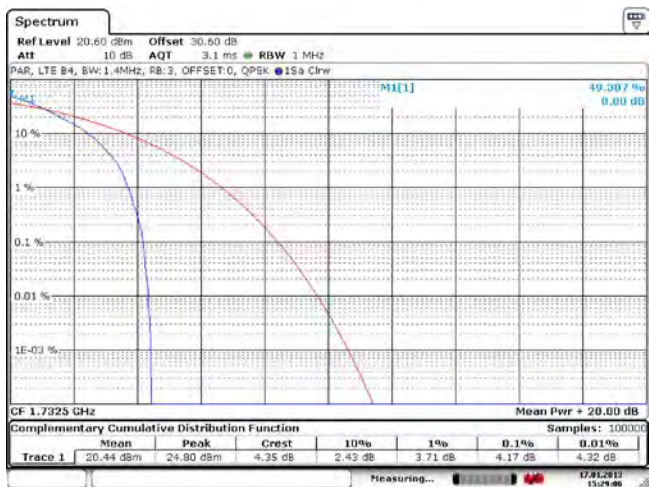
**Figure 5-47a: Band 4 Mid Channel PAR, 10MHz BW, RB=25, QPSK**



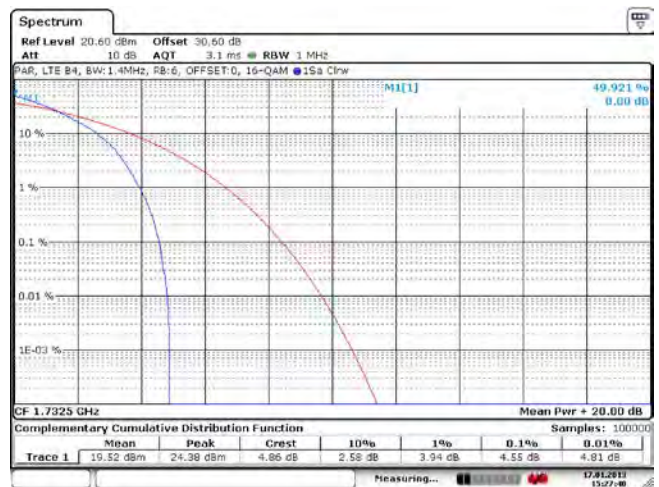
**Figure 5-48a: Band 4 Mid Channel PAR, 10MHz BW, RB=50, 16-QAM**




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



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

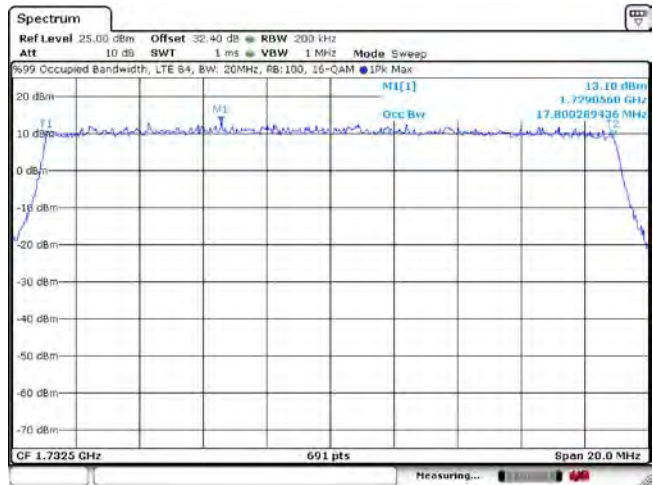
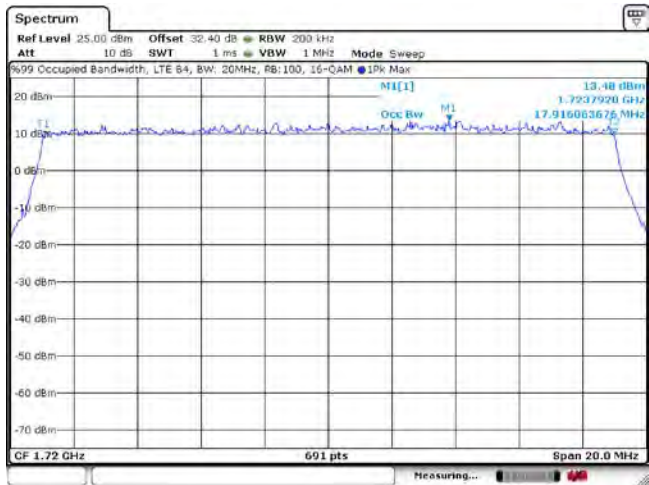


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 5A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

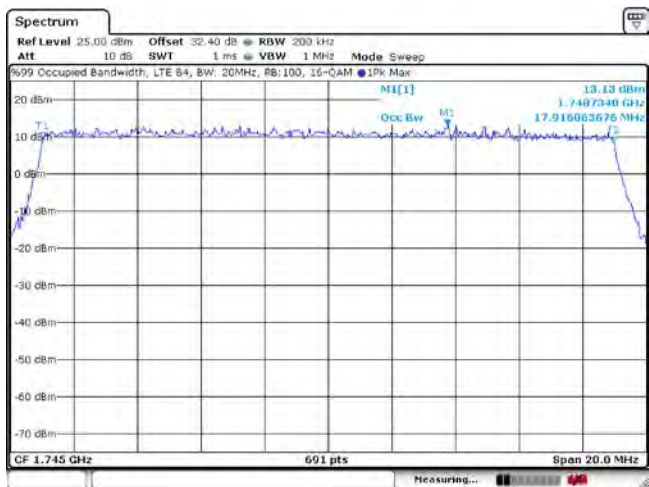
LTE Band 4 Conducted RF Emission Test Data cont'd

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


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



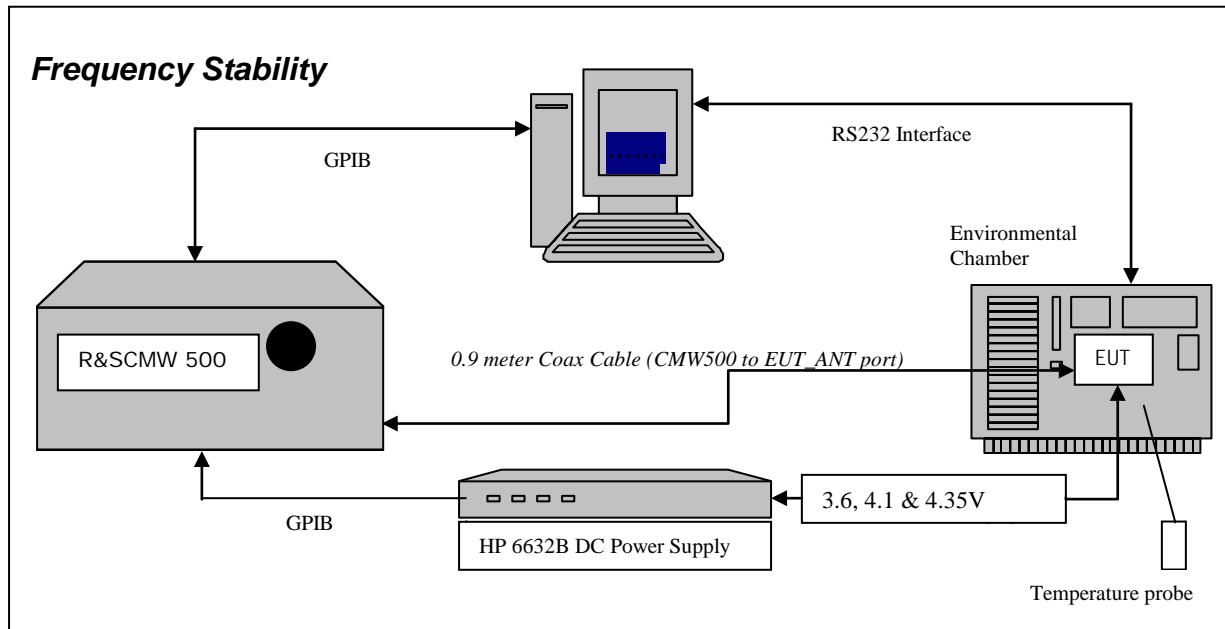
**Figure 5-53a: Occupied Bandwidth, Band 4 High Channel, 20MHz BW (RB= 100) 16-QAM**



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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### LTE Band 4 Frequency Stability Test Data



The following measurements were performed by Berkin Can.

#### **CFR 47 Chapter 1 - Federal Communications Commission Rules**


#### **Part 2 Required Measurements**

##### **2.1055** Frequency Stability - Procedures

- (a,b) Frequency Stability - Temperature Variation
- (d) Frequency Stability - Voltage Variation

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

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

## Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.

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


A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMW 500 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

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

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 1720.0 MHz, 1732.5 MHz and 1745.0 MHz each was measured under 20 MHz bandwidth with maximum (100) resource blocks. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.

After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5B</b>	
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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 **0.0227 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

Date of test: July 03, 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	18.05	0.0105
20175	1732.5	3.6	20	4.82	0.0028
20300	1745.0	3.6	20	16.16	0.0093

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	20	18.77	0.0109
20175	1732.5	4.1	20	3.74	0.0022
20300	1745.0	4.1	20	19.83	0.0114

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	20	22.09	0.0128
20175	1732.5	4.35	20	8.46	0.0049
20300	1745.0	4.35	20	4.79	0.0027


**Test Report No.:**  
 RTS-6026-1302-12\_Rev1

**Dates of Test:**  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

LTE band 4 Results: channel 20050 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	3.6	-30	14.67	0.0085
20050	1720.0	3.6	-20	17.98	0.0105
20050	1720.0	3.6	-10	13.65	0.0079
20050	1720.0	3.6	0	19.25	0.0112
20050	1720.0	3.6	10	17.07	0.0099
20050	1720.0	3.6	20	18.05	0.0105
20050	1720.0	3.6	30	18.71	0.0109
20050	1720.0	3.6	40	18.20	0.0106
20050	1720.0	3.6	50	24.95	0.0145
20050	1720.0	3.6	60	17.90	0.0104
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.1	-30	17.96	0.0104
20050	1720.0	4.1	-20	19.22	0.0112
20050	1720.0	4.1	-10	21.03	0.0122
20050	1720.0	4.1	0	20.03	0.0116
20050	1720.0	4.1	10	22.77	0.0132
20050	1720.0	4.1	20	18.77	0.0109
20050	1720.0	4.1	30	33.21	0.0193
20050	1720.0	4.1	40	17.28	0.0100
20050	1720.0	4.1	50	12.85	0.0075
20050	1720.0	4.1	60	19.33	0.0112
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	-30	16.83	0.0098
20050	1720.0	4.35	-20	17.22	0.0100
20050	1720.0	4.35	-10	20.44	0.0119
20050	1720.0	4.35	0	18.24	0.0106
20050	1720.0	4.35	10	18.02	0.0105
20050	1720.0	4.35	20	22.09	0.0128
20050	1720.0	4.35	30	20.75	0.0121
20050	1720.0	4.35	40	16.34	0.0095
20050	1720.0	4.35	50	8.51	0.0050
20050	1720.0	4.35	60	19.51	0.0113

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

**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	16.54	0.0095
20175	1732.5	3.6	-20	14.64	0.0084
20175	1732.5	3.6	-10	3.81	0.0022
20175	1732.5	3.6	0	6.60	0.0038
20175	1732.5	3.6	10	15.08	0.0087
20175	1732.5	3.6	20	4.82	0.0028
20175	1732.5	3.6	30	6.63	0.0038
20175	1732.5	3.6	40	-0.06	0.0000
20175	1732.5	3.6	50	20.70	0.0119
20175	1732.5	3.6	60	8.45	0.0049
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.1	-30	5.53	0.0032
20175	1732.5	4.1	-20	8.08	0.0047
20175	1732.5	4.1	-10	14.12	0.0081
20175	1732.5	4.1	0	20.03	0.0116
20175	1732.5	4.1	10	3.64	0.0021
20175	1732.5	4.1	20	3.74	0.0022
20175	1732.5	4.1	30	3.98	0.0023
20175	1732.5	4.1	40	0.15	0.0001
20175	1732.5	4.1	50	17.36	0.0100
20175	1732.5	4.1	60	4.44	0.0026
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.35	-30	-0.02	0.0000
20175	1732.5	4.35	-20	-0.42	-0.0002
20175	1732.5	4.35	-10	17.34	0.0100
20175	1732.5	4.35	0	16.65	0.0096
20175	1732.5	4.35	10	1.99	0.0011
20175	1732.5	4.35	20	8.46	0.0049
20175	1732.5	4.35	30	18.09	0.0104
20175	1732.5	4.35	40	-0.14	-0.0001
20175	1732.5	4.35	50	15.06	0.0087
20175	1732.5	4.35	60	9.45	0.0055

Test Report No.:  
 RTS-6026-1302-12\_Rev1


Dates of Test:  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

FCC ID: L6ARFL110LW  
 IC: 2503A-RFL110LW

**LTE band 4 Results: channel 20300 @ maximum transmitted power**

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	3.6	-30	6.41	0.0037
20300	1745.0	3.6	-20	6.82	0.0039
20300	1745.0	3.6	-10	0.57	0.0003
20300	1745.0	3.6	0	9.77	0.0056
20300	1745.0	3.6	10	3.34	0.0019
20300	1745.0	3.6	20	16.16	0.0093
20300	1745.0	3.6	30	<b>39.63</b>	<b>0.0227</b>
20300	1745.0	3.6	40	0.75	0.0004
20300	1745.0	3.6	50	21.70	0.0124
20300	1745.0	3.6	60	4.93	0.0028
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.1	-30	-3.37	-0.0019
20300	1745.0	4.1	-20	20.46	0.0117
20300	1745.0	4.1	-10	-1.84	-0.0011
20300	1745.0	4.1	0	3.70	0.0021
20300	1745.0	4.1	10	16.57	0.0095
20300	1745.0	4.1	20	19.83	0.0114
20300	1745.0	4.1	30	0.70	0.0004
20300	1745.0	4.1	40	21.26	0.0122
20300	1745.0	4.1	50	4.93	0.0028
20300	1745.0	4.1	60	2.37	0.0014
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.35	-30	17.80	0.0102
20300	1745.0	4.35	-20	16.69	0.0096
20300	1745.0	4.35	-10	12.47	0.0071
20300	1745.0	4.35	0	5.50	0.0032
20300	1745.0	4.35	10	8.91	0.0051
20300	1745.0	4.35	20	4.79	0.0027
20300	1745.0	4.35	30	5.18	0.0030
20300	1745.0	4.35	40	22.04	0.0126
20300	1745.0	4.35	50	17.86	0.0102
20300	1745.0	4.35	60	23.90	0.0137

## APPENDIX 5C – LTE Band 4 RADIATED EMISSIONS TEST DATA

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 5C</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

### Radiated Power Test Data Results

Date of Test: January 16, 2013

The following measurements were performed by Feras Obeid.

The environmental tests conditions were: Temperature: 25.0 °C  
Relative Humidity: 29.5 %

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

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

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

#### **LTE band 4, 20MHz BW, RB=1, QPSK modulation**

EUT							Rx Antenna		Spectrum Analyzer		Substitution Method			
EUT							Rx Antenna		Spectrum Analyzer		Tracking Generator			
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)	
										(dBm)	(W)			
F0	20050	1720.00	4	Horn	V	-23.30	-23.30	V-V	-16.42	24.43	0.28	30.00	-5.57	
F0	20050	1720.00	4	Horn	H	-31.28		H-H	-14.99					
F0	20175	1732.50	4	Horn	V	-23.36	-23.36	V-V	-15.62	24.54	0.28	30.00	-5.46	
F0	20175	1732.50	4	Horn	H	-31.22		H-H	-15.09					
F0	20299	1744.90	4	Horn	V	-23.36	-23.36	V-V	-15.32	24.65	0.29	30.00	-5.35	
F0	20299	1744.90	4	Horn	H	-31.22		H-H	-14.69					

#### **LTE band 4, 20MHz BW, RB=1, 16-QAM modulation**

EUT							Rx Antenna		Spectrum Analyzer		Substitution Method			
EUT							Rx Antenna		Spectrum Analyzer		Tracking Generator			
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBuV)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)	
										(dBm)	(W)			
F0	20050	1720.00	4	Horn	V	-24.62	-24.62	V-V	-16.79	23.10	0.20	30.00	-6.90	
F0	20050	1720.00	4	Horn	H	-32.55		H-H	-16.32					
F0	20175	1732.50	4	Horn	V	-24.64	-24.64	V-V	-16.90	23.12	0.21	30.00	-6.88	
F0	20175	1732.50	4	Horn	H	-32.44		H-H	-16.51					
F0	20299	1744.90	4	Horn	V	-24.53	-24.53	V-V	-16.44	23.48	0.22	30.00	-6.52	
F0	20299	1744.90	4	Horn	H	-32.42		H-H	-15.86					


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



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 6A</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

#### Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Emission Designator	Band	Bandwidth (MHz)	Modulation
706.5-713.5	23.7	4M47G7D	LTE B17	5	QPSK
706.5-713.5	22.7	4M47D7W	LTE B17	5	16QAM
709-711	23.70	8M94G7D	LTE B17	10	QPSK
709-711	22.55	8M94D7W	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 9.407MHz. 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.

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	<b>APPENDIX 6A</b>	
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**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	9.276	8.944	8.944
710.0	9.262	8.929	8.944
711.0	9.275	8.929	8.944

**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.

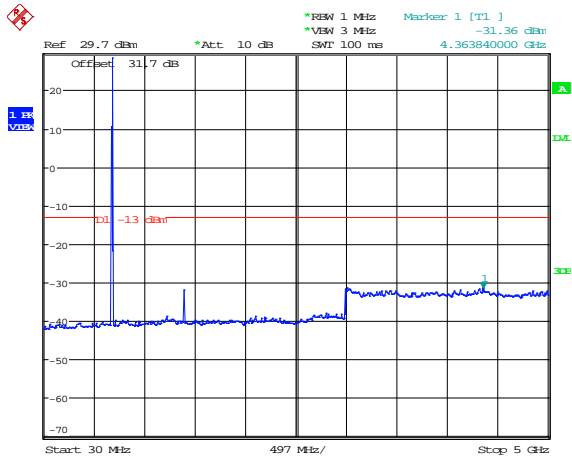
See Figures 6-25a to 6-32a for the plots of the Channel mask.

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

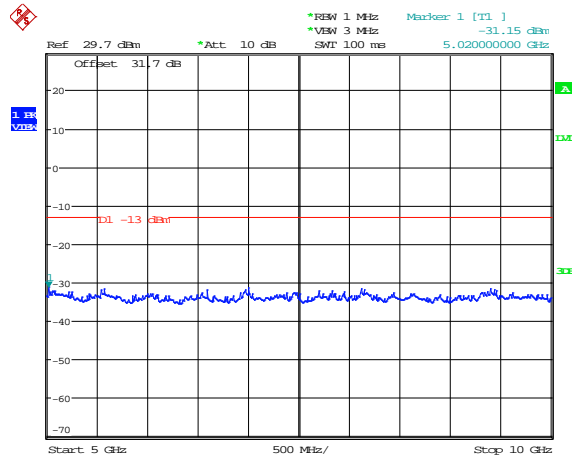
LTE Band 17 Conducted RF Emission Test Data cont'd

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



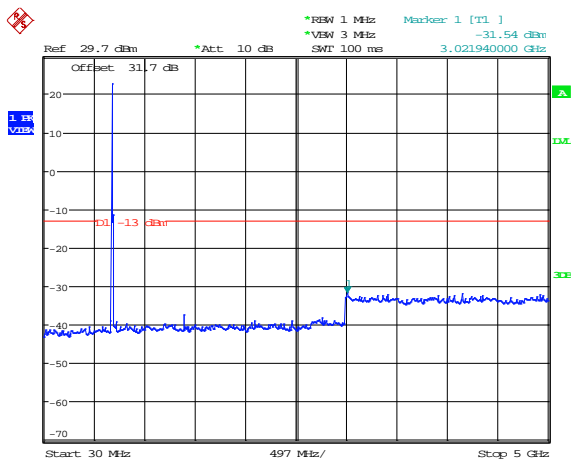
Date: 21.JAN.2013 12:13:34

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



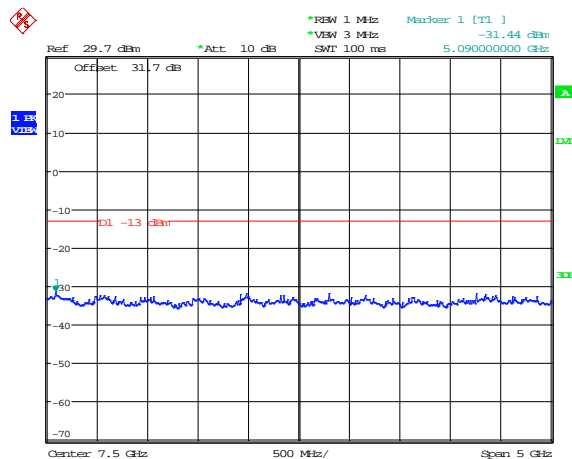
Date: 21.JAN.2013 12:15:05

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




Date: 21.JAN.2013 12:18:51

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

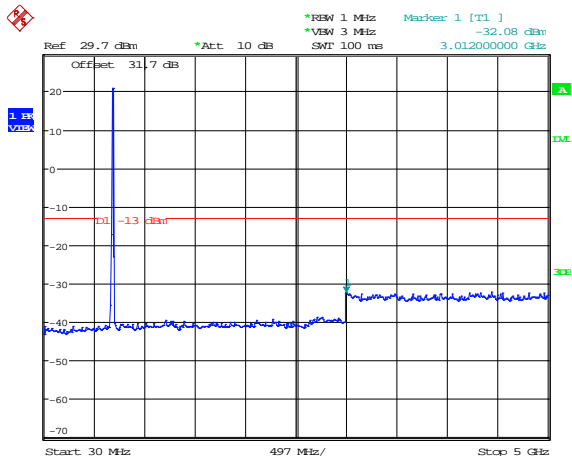


Date: 21.JAN.2013 12:17:18

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

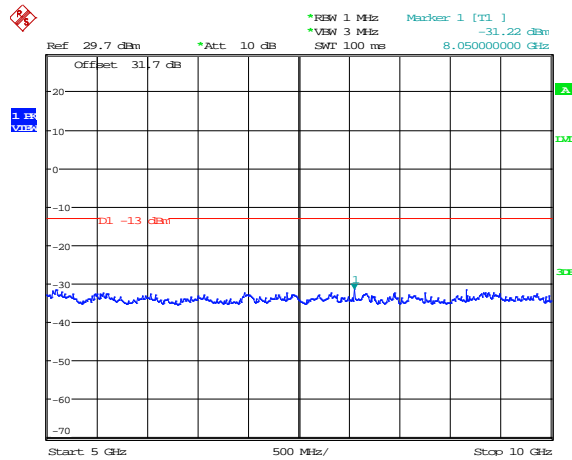
**LTE Band 17 Conducted RF Emission Test Data cont'd**

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



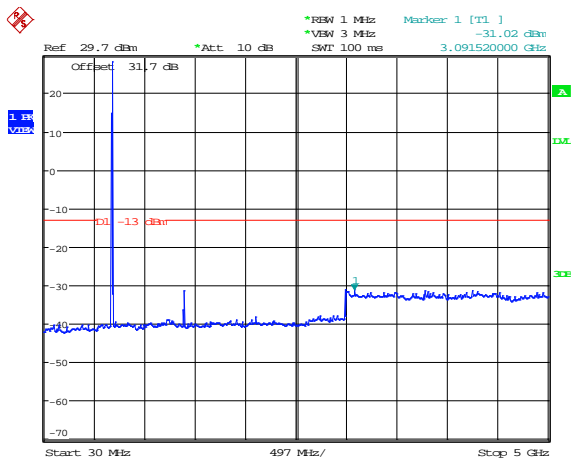
Date: 21.JAN.2013 12:20:20

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



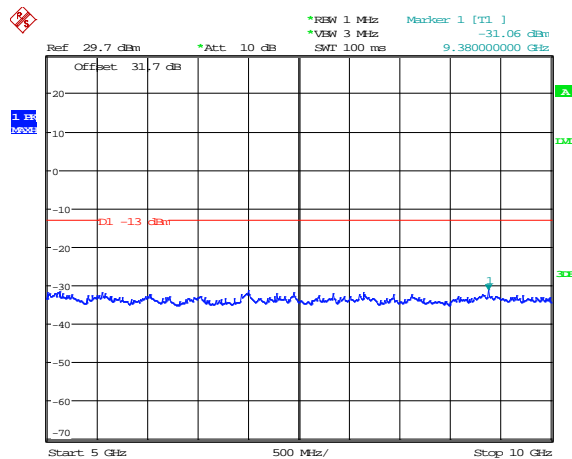
Date: 21.JAN.2013 12:21:47

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




Date: 21.JAN.2013 12:32:26

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

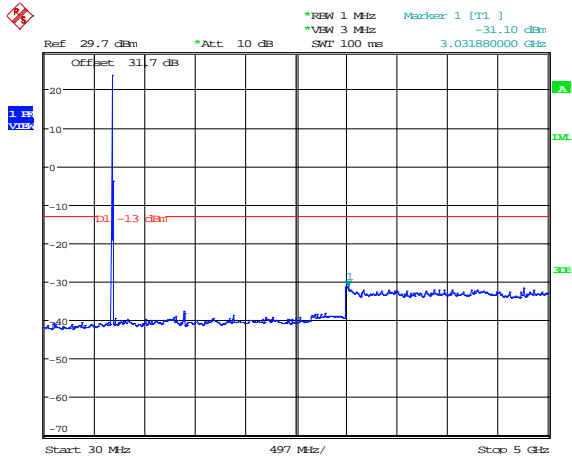


Date: 21.JAN.2013 12:23:44

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

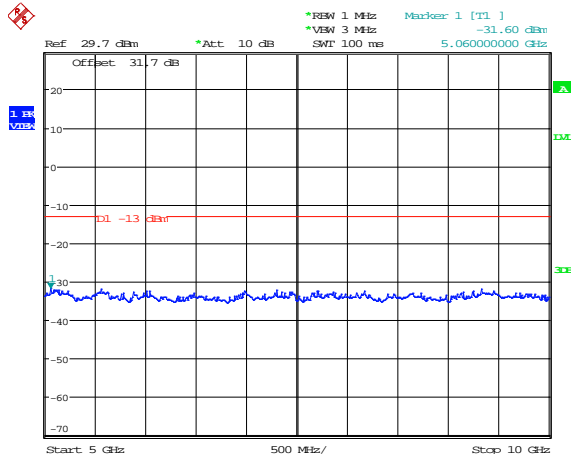
**LTE Band 17 Conducted RF Emission Test Data cont'd**

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



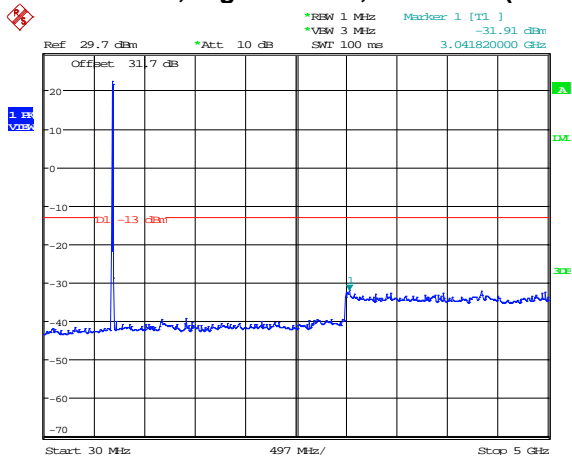
Date: 21.JAN.2013 13:48:34

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



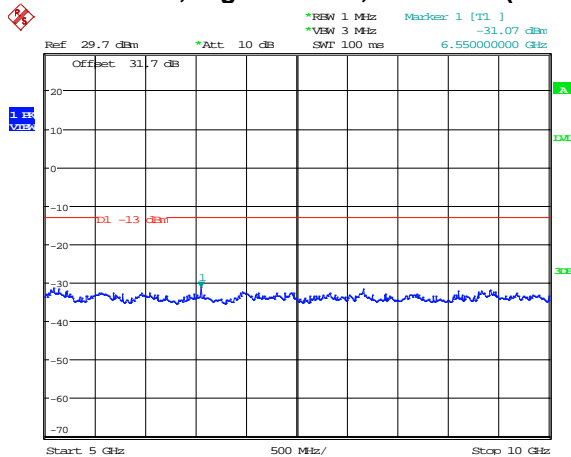
Date: 21.JAN.2013 13:49:40

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




Date: 21.JAN.2013 13:51:35

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

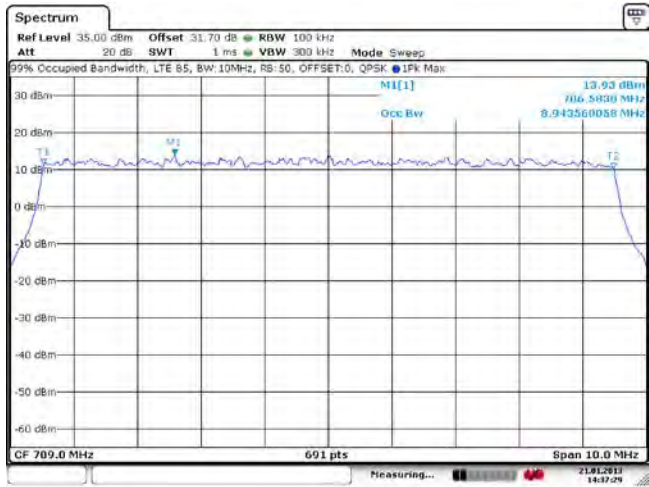


Date: 21.JAN.2013 13:51:02

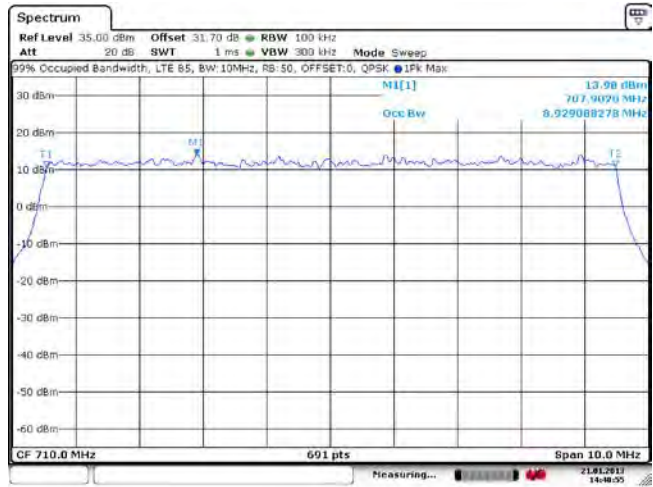
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 6A</b>	
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### LTE Band 17 Conducted RF Emission Test Data cont'd

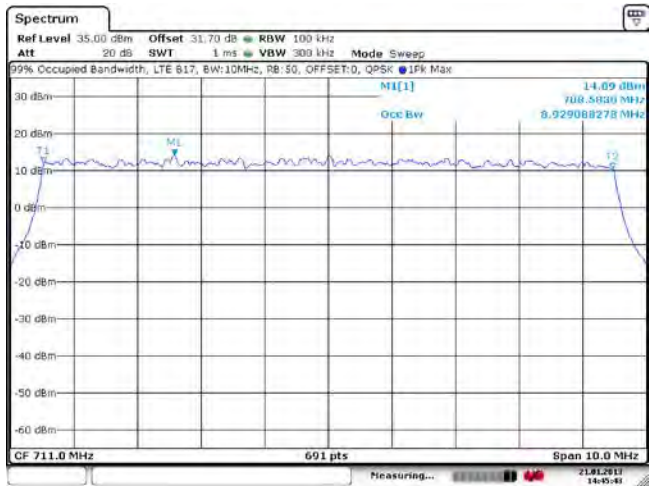
**Figure 6-13a: Occupied Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50**




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



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



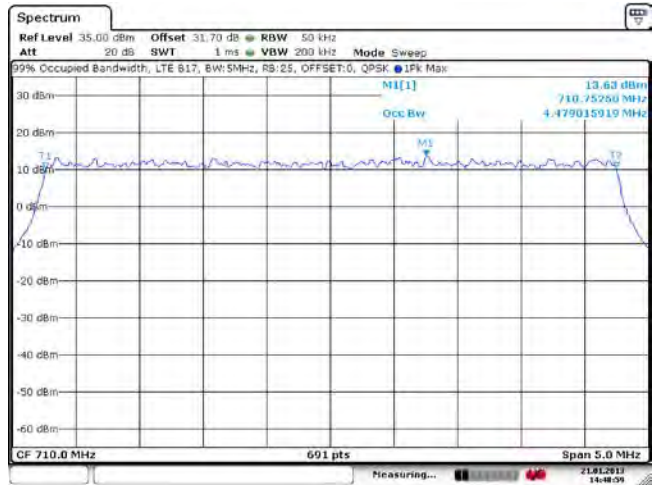
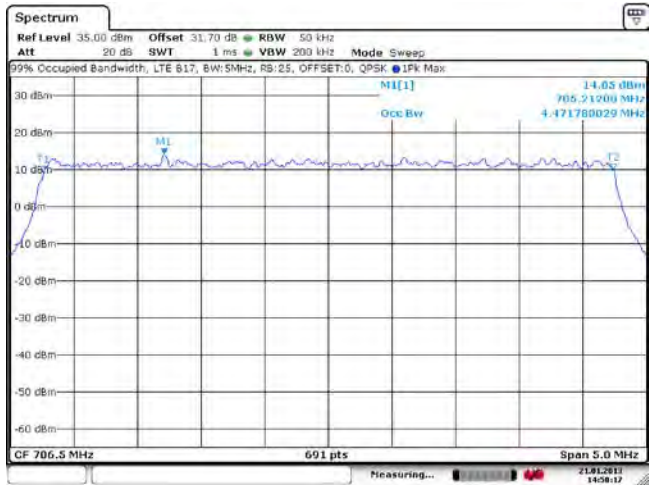


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

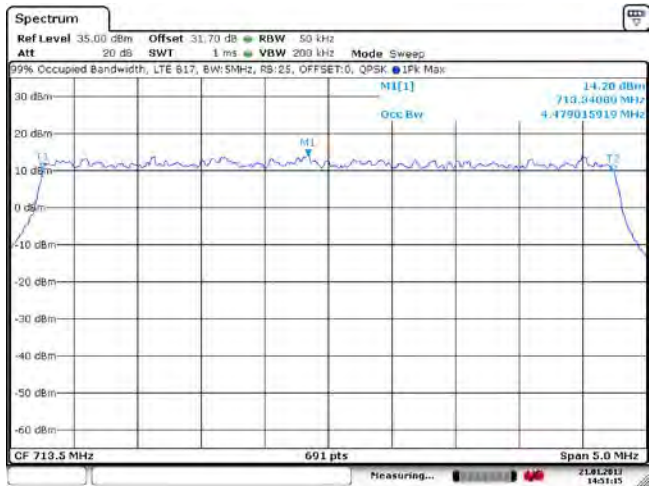
**LTE Band 17 Conducted RF Emission Test Data cont'd**


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

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



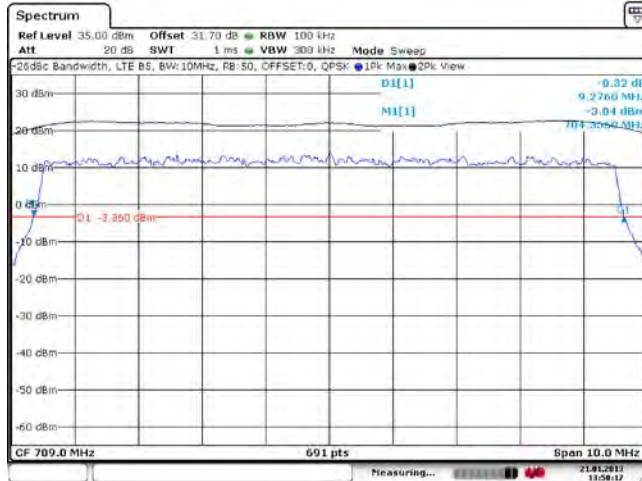
**Figure 6-18a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=25**



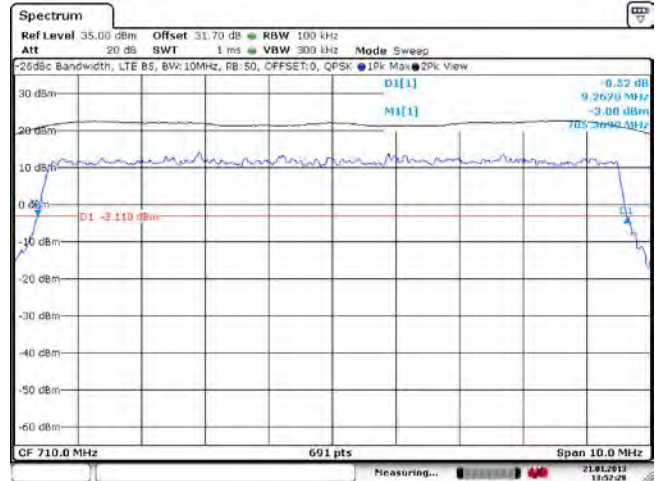
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

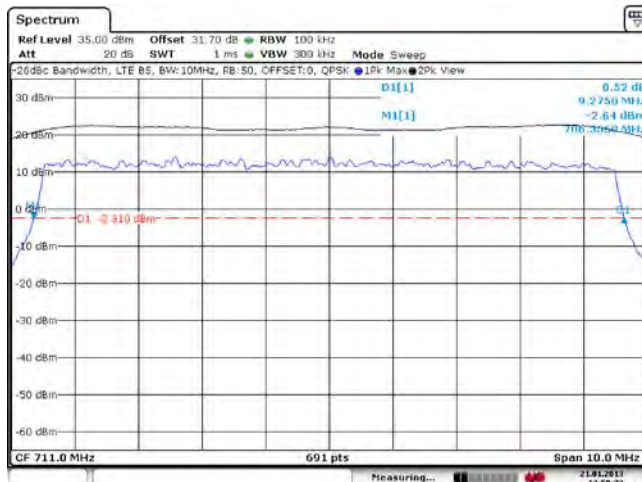
**Figure 6-19a: -26 dBc Bandwidth, Band 17 Low Channel, 10MHz BW, RB=50**



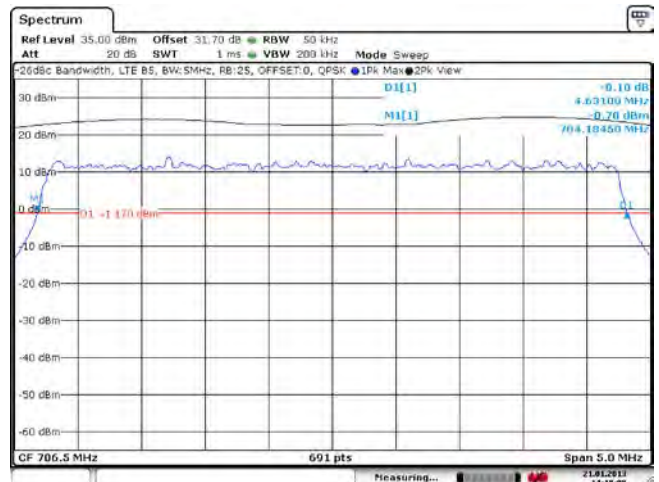
**Figure 6-20a: -26 dBc Bandwidth, Band 17 Middle Channel, 10MHz BW, RB=50**




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



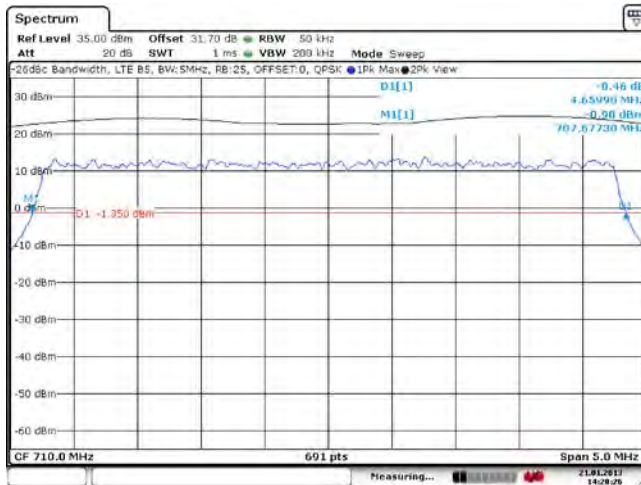
**Figure 6-22a: -26 dBc Bandwidth, Band 17 Low Channel, 5MHz BW, RB=25**



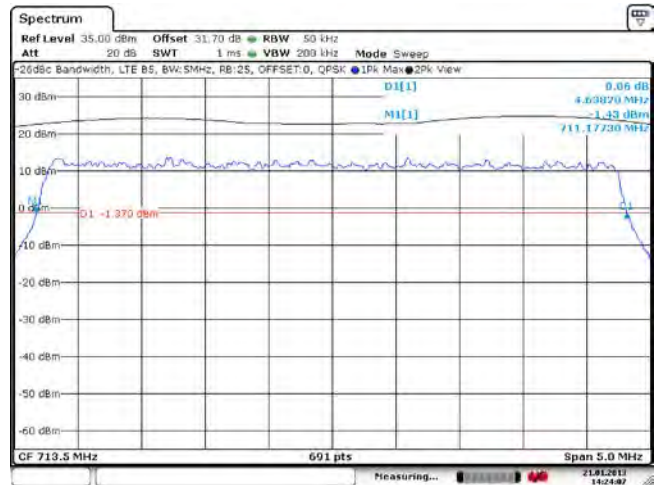
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

LTE Band 17 Conducted RF Emission Test Data cont'd

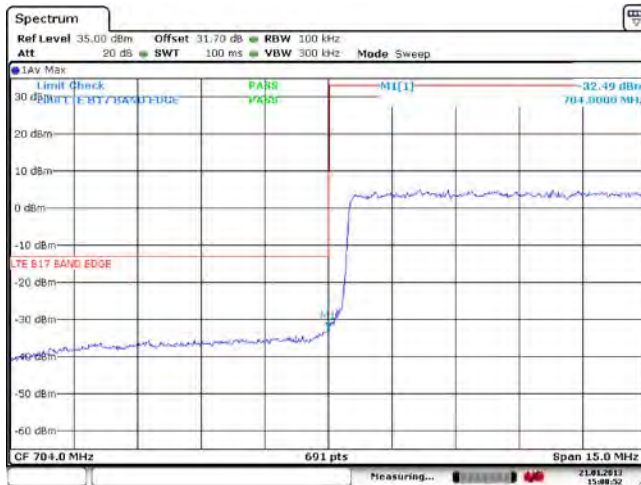
**Figure 6-23a: -26 dBc Bandwidth, Band 17 Middle Channel, 5MHz BW, RB=25**



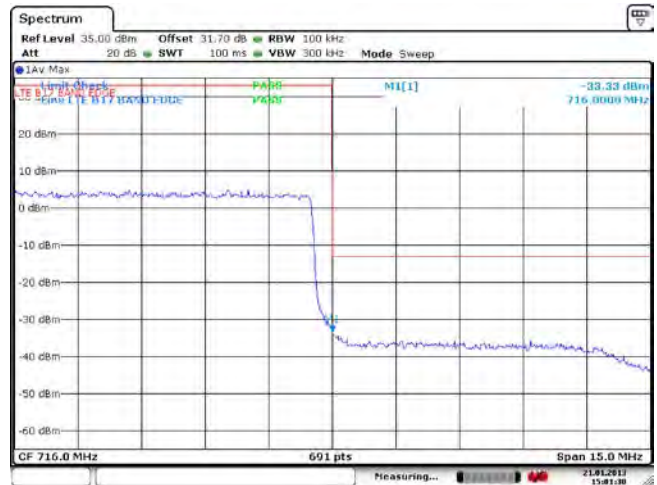
**Figure 6-24a: -26 dBc Bandwidth, Band 17 High Channel, 5MHz BW, RB=25**




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



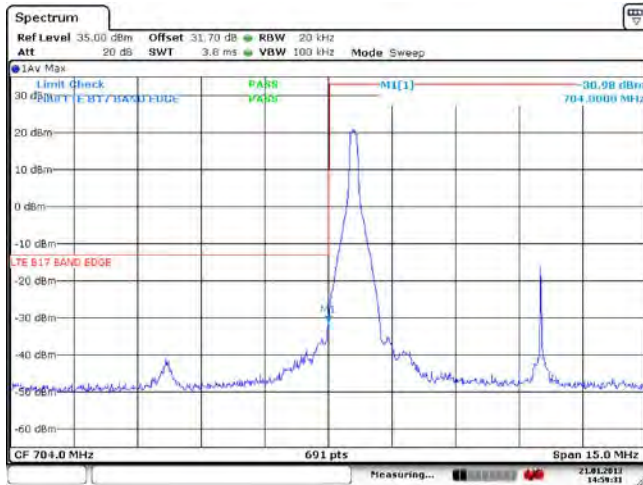
**Figure 6-26a: Band 17 High Channel Mask, 10MHz BW, RB=50**



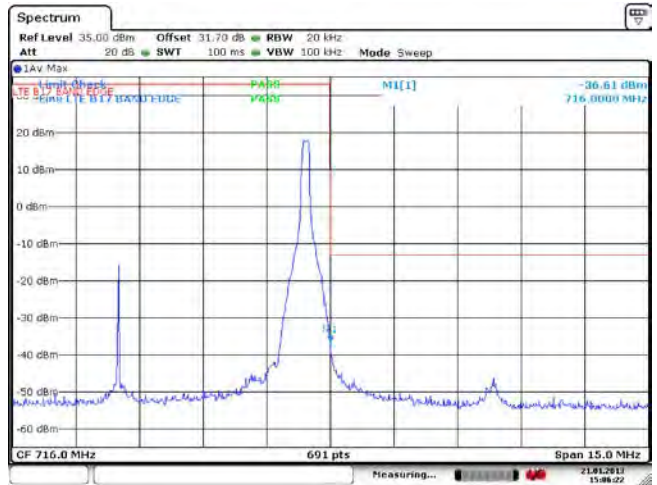
	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

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

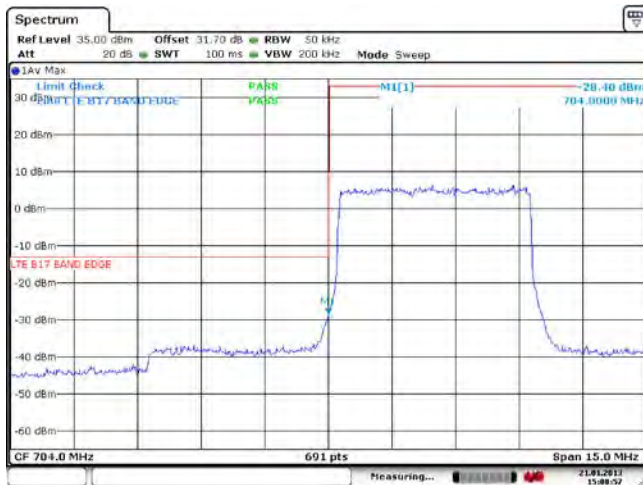
**Figure 6-27a: Band 17 Low Channel Mask, 10MHz BW, RB=1**



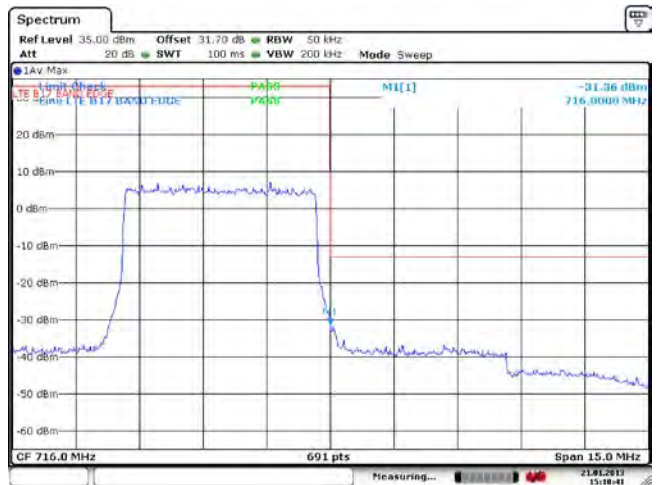
**Figure 6-28a: Band 17 High Channel Mask, 10MHz BW, RB=1**




**Figure 6-29a: Band 17 Low Channel Mask, 5MHz BW, RB=25**



**Figure 6-30a: Band 17 High Channel Mask, 5MHz BW, RB=25**

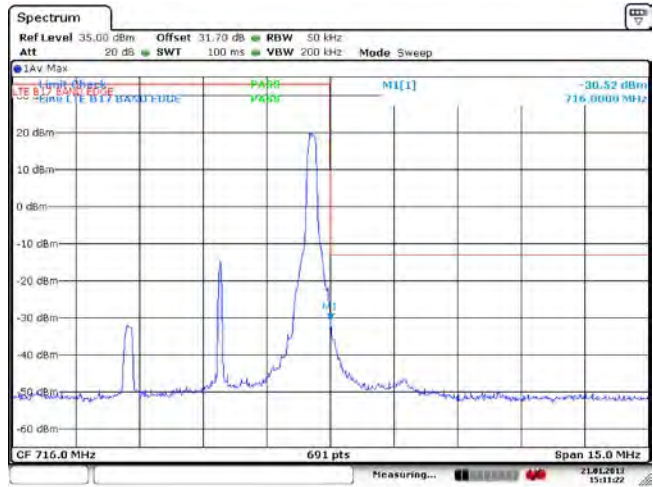
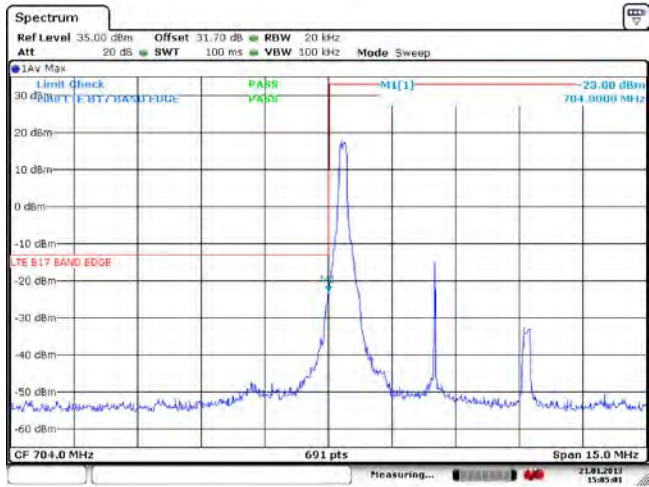


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
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<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

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

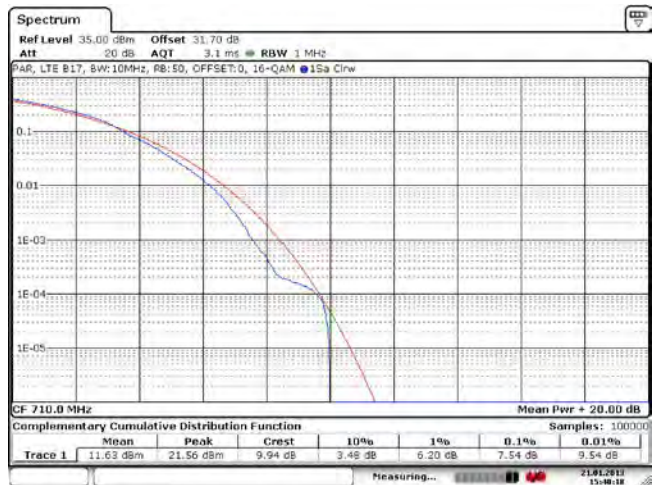
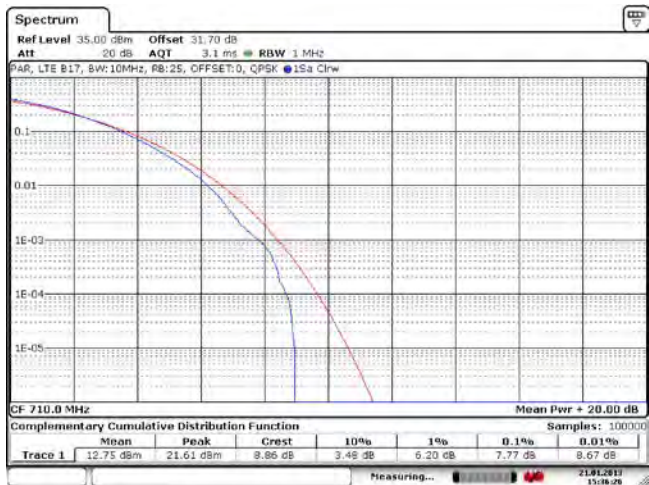
**Figure 6-31a: Band 17 Low Channel Mask, 5MHz BW, RB=1**


**Figure 6-32a: Band 17 High Channel Mask, 5MHz BW, RB=1**



**Figure 6-33a: Band 17 Mid Channel PAR, 10MHz BW, RB=25**

**Figure 6-34a: Band 17 Middle Channel PAR, 10MHz BW, RB=50**

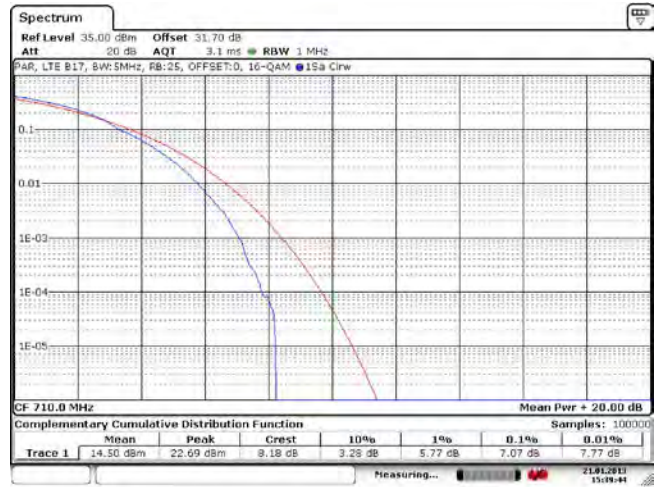
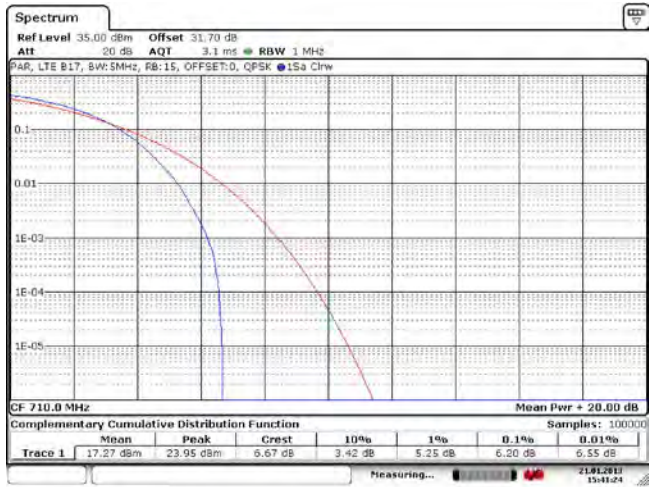



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

LTE Band 17 Conducted RF Emission Test Data cont'd

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

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

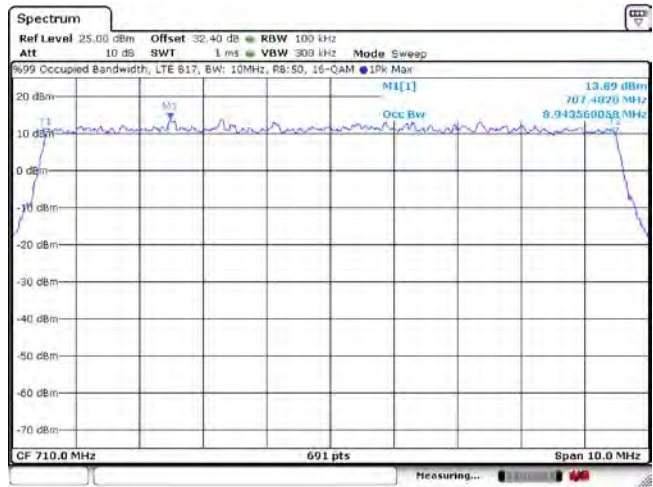
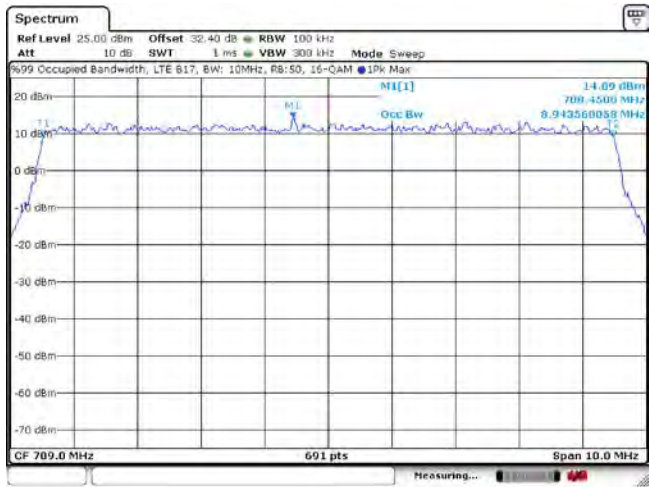


	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6A</b>	
	<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013

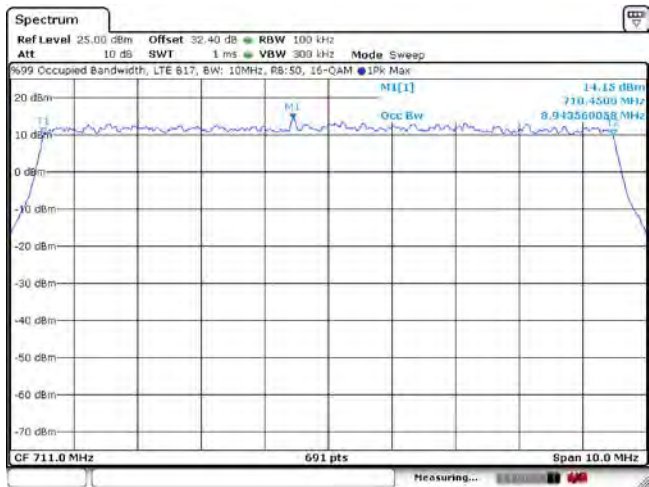
LTE Band 17 Conducted RF Emission Test Data cont'd

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

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




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

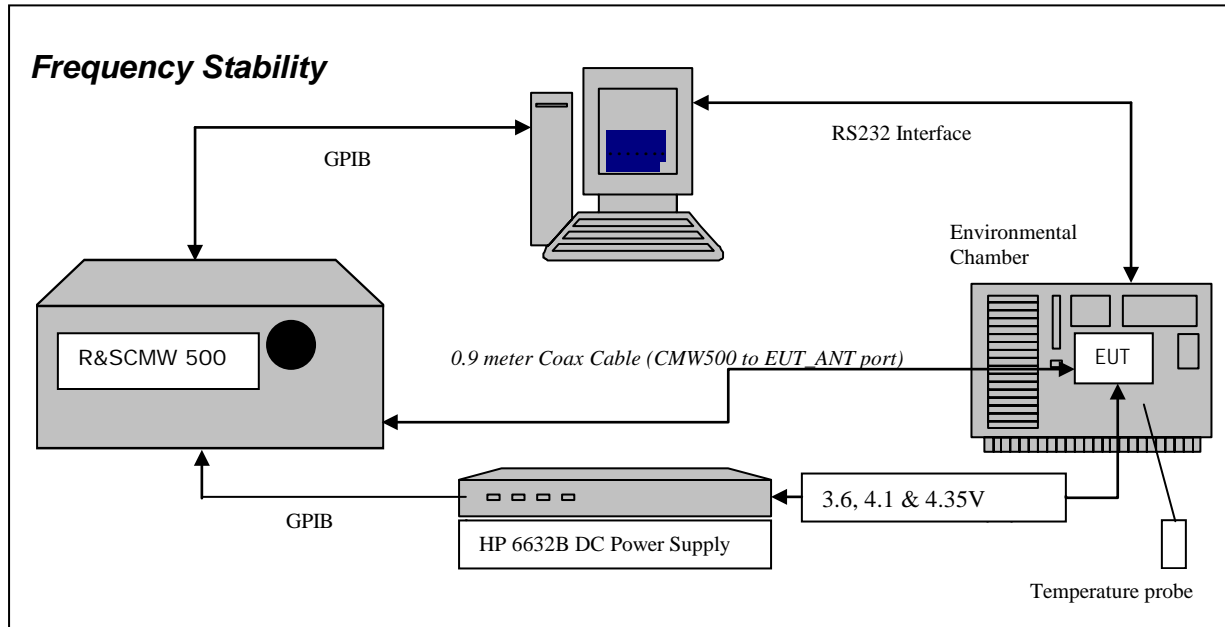


APPENDIX 6B – LTE Band 17 FREQUENCY STABILITY TEST DATA



	EMI Test Report for the BlackBerry® smartphone Model RFL111LW <b>APPENDIX 6B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

LTE Band 17 Frequency Stability Test Data



The following measurements were performed by Berkin Can.


**CFR 47 Chapter 1 - Federal Communications Commission Rules**

**Part 2 Required Measurements**

- 2.1055** Frequency Stability - Procedures
- (a,b) Frequency Stability - Temperature Variation
- (d) Frequency Stability - Voltage Variation

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

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

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 6B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

## Test Setup:

The EUT was placed in the Temperature chamber and connected to CMW 500 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.


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

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMW 500 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

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

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 709.0 MHz, 710.0 MHz and 711.0 MHz each was measured under 10 MHz bandwidth with maximum (50) resource blocks. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.

After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 6B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW


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 **0.0272 PPM**.

	EMI Test Report for the BlackBerry® smartphone Model RFL111LW	
	<b>APPENDIX 6B</b>	
<b>Test Report No.:</b> RTS-6026-1302-12_Rev1	<b>Dates of Test:</b> November 22, 2012 to February 04, 2013, March 04 and April 05, 2013	<b>FCC ID:</b> L6ARFL110LW <b>IC:</b> 2503A-RFL110LW

Date of test: January 22, 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	3.18	0.0045
23790	710.0	3.6	20	16.62	0.0234
23800	711.0	3.6	20	1.16	0.0016

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	20	5.21	0.0073
23790	710.0	4.1	20	7.32	0.0103
23800	711.0	4.1	20	-1.02	-0.0014

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	20	-0.13	-0.0002
23790	710.0	4.35	20	15.33	0.0216
23800	711.0	4.35	20	11.67	0.0164

**Test Report No.:**  
 RTS-6026-1302-12\_Rev1

**Dates of Test:**  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

**LTE band 17 Results: channel 23780 @ maximum transmitted power**

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.6	-30	-0.97	-0.0014
23780	709.0	3.6	-20	4.24	0.0060
23780	709.0	3.6	-10	6.54	0.0092
23780	709.0	3.6	0	-9.71	-0.0137
23780	709.0	3.6	10	<b>19.27</b>	<b>0.0272</b>
23780	709.0	3.6	20	3.18	0.0045
23780	709.0	3.6	30	6.26	0.0088
23780	709.0	3.6	40	6.86	0.0097
23780	709.0	3.6	50	0.96	0.0014
23780	709.0	3.6	60	7.46	0.0105
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.1	-30	2.56	0.0036
23780	709.0	4.1	-20	9.40	0.0133
23780	709.0	4.1	-10	3.98	0.0056
23780	709.0	4.1	0	13.53	0.0191
23780	709.0	4.1	10	0.86	0.0012
23780	709.0	4.1	20	5.21	0.0073
23780	709.0	4.1	30	10.89	0.0154
23780	709.0	4.1	40	-5.86	-0.0083
23780	709.0	4.1	50	-7.59	-0.0107
23780	709.0	4.1	60	9.99	0.0141
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	-30	1.82	0.0026
23780	709.0	4.35	-20	6.30	0.0089
23780	709.0	4.35	-10	8.37	0.0118
23780	709.0	4.35	0	0.41	0.0006
23780	709.0	4.35	10	15.29	0.0216
23780	709.0	4.35	20	-0.13	-0.0002
23780	709.0	4.35	30	6.50	0.0092
23780	709.0	4.35	40	-1.82	-0.0026
23780	709.0	4.35	50	10.18	0.0144
23780	709.0	4.35	60	14.54	0.0205

**Test Report No.:**  
 RTS-6026-1302-12\_Rev1

**Dates of Test:**  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

**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	11.81	0.0166
23790	710.0	3.6	-20	7.71	0.0109
23790	710.0	3.6	-10	9.15	0.0129
23790	710.0	3.6	0	18.88	0.0266
23790	710.0	3.6	10	0.15	0.0002
23790	710.0	3.6	20	16.62	0.0234
23790	710.0	3.6	30	13.16	0.0185
23790	710.0	3.6	40	13.19	0.0186
23790	710.0	3.6	50	16.21	0.0228
23790	710.0	3.6	60	16.57	0.0233
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.1	-30	14.25	0.0201
23790	710.0	4.1	-20	9.79	0.0138
23790	710.0	4.1	-10	12.94	0.0182
23790	710.0	4.1	0	-2.55	-0.0036
23790	710.0	4.1	10	9.06	0.0128
23790	710.0	4.1	20	7.32	0.0103
23790	710.0	4.1	30	3.73	0.0053
23790	710.0	4.1	40	9.77	0.0138
23790	710.0	4.1	50	10.13	0.0143
23790	710.0	4.1	60	6.27	0.0088
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.35	-30	4.35	0.0061
23790	710.0	4.35	-20	5.40	0.0076
23790	710.0	4.35	-10	8.63	0.0122
23790	710.0	4.35	0	13.55	0.0191
23790	710.0	4.35	10	-0.51	-0.0007
23790	710.0	4.35	20	15.33	0.0216
23790	710.0	4.35	30	3.27	0.0046
23790	710.0	4.35	40	4.19	0.0059
23790	710.0	4.35	50	8.71	0.0123
23790	710.0	4.35	60	-0.43	-0.0006

**Test Report No.:**  
 RTS-6026-1302-12\_Rev1

**Dates of Test:**  
 November 22, 2012 to February 04, 2013,  
 March 04 and April 05, 2013

**FCC ID:** L6ARFL110LW  
**IC:** 2503A-RFL110LW

**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	1.88	0.0026
23800	711.0	3.6	-20	3.62	0.0051
23800	711.0	3.6	-10	-0.80	-0.0011
23800	711.0	3.6	0	-0.50	-0.0007
23800	711.0	3.6	10	11.56	0.0163
23800	711.0	3.6	20	1.16	0.0016
23800	711.0	3.6	30	2.57	0.0036
23800	711.0	3.6	40	1.15	0.0016
23800	711.0	3.6	50	13.06	0.0184
23800	711.0	3.6	60	3.50	0.0049
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.1	-30	0.17	0.0002
23800	711.0	4.1	-20	2.99	0.0042
23800	711.0	4.1	-10	-0.82	-0.0012
23800	711.0	4.1	0	10.49	0.0148
23800	711.0	4.1	10	-4.86	-0.0068
23800	711.0	4.1	20	-1.02	-0.0014
23800	711.0	4.1	30	14.70	0.0207
23800	711.0	4.1	40	13.65	0.0192
23800	711.0	4.1	50	6.27	0.0088
23800	711.0	4.1	60	11.99	0.0169
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.35	-30	4.01	0.0056
23800	711.0	4.35	-20	2.57	0.0036
23800	711.0	4.35	-10	-2.93	-0.0041
23800	711.0	4.35	0	11.01	0.0155
23800	711.0	4.35	10	15.04	0.0212
23800	711.0	4.35	20	11.67	0.0164
23800	711.0	4.35	30	1.79	0.0025
23800	711.0	4.35	40	14.18	0.0199
23800	711.0	4.35	50	1.47	0.0021
23800	711.0	4.35	60	4.26	0.0060

## APPENDIX 6C – LTE Band 17 RADIATED EMISSIONS TEST DATA





