	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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

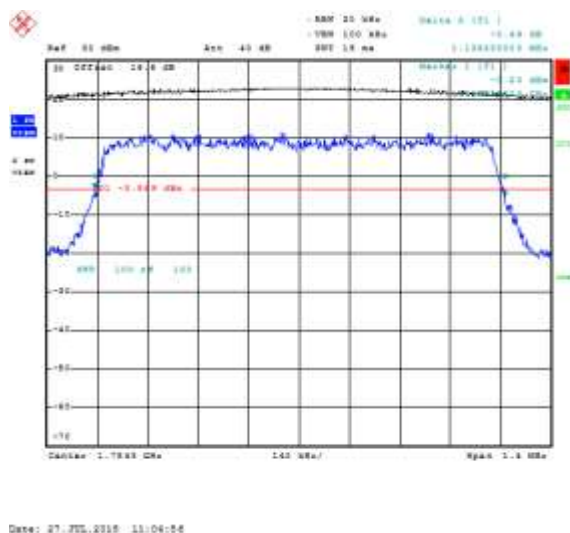


Figure 5-37a: Band 4 Low Channel Mask, 20MHz BW, RB=100

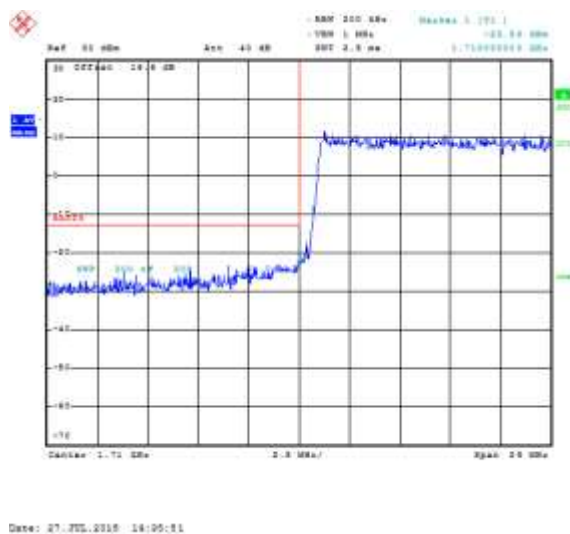
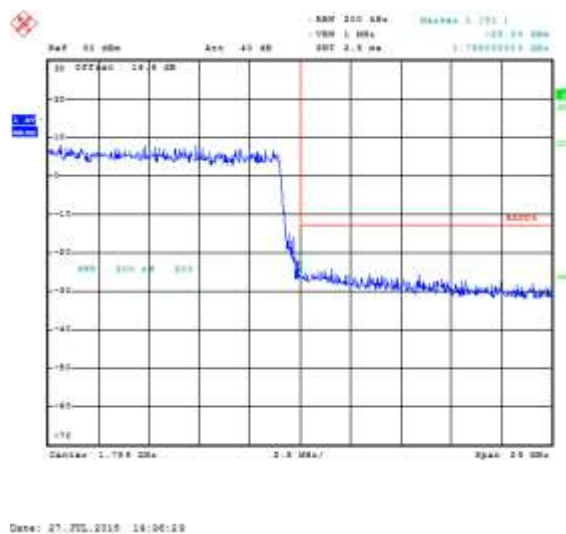



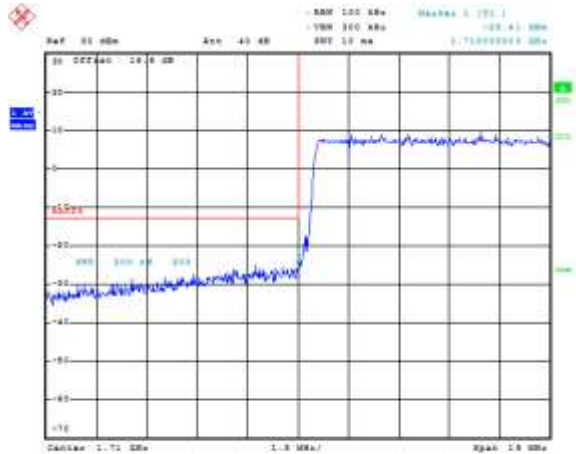
Figure 5-38a: Band 4 High Channel Mask, 20MHz BW, RB=100



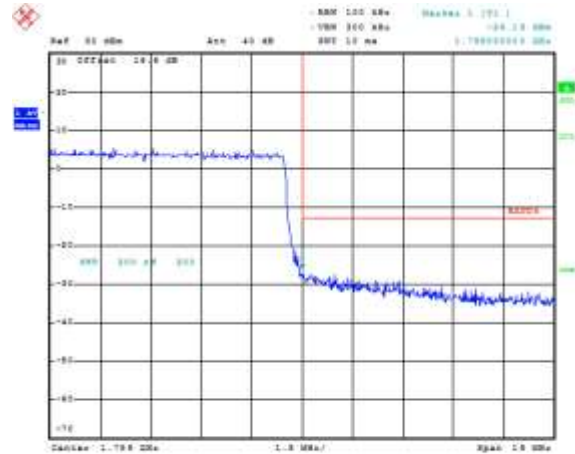
	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 4 Conducted RF Emission Test Data cont'd

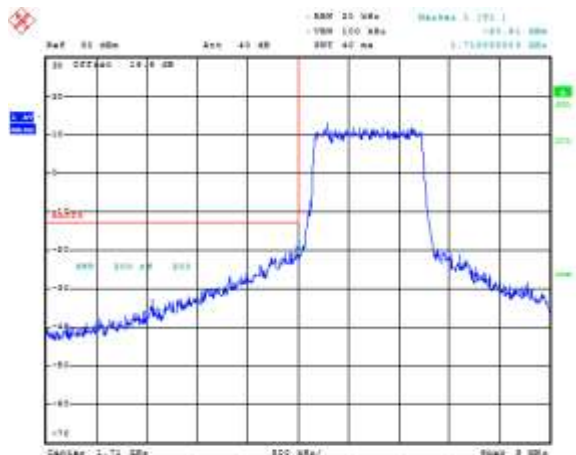
**Figure 5-39a: Band 4 Low Channel Mask, 10MHz
BW, RB=50**



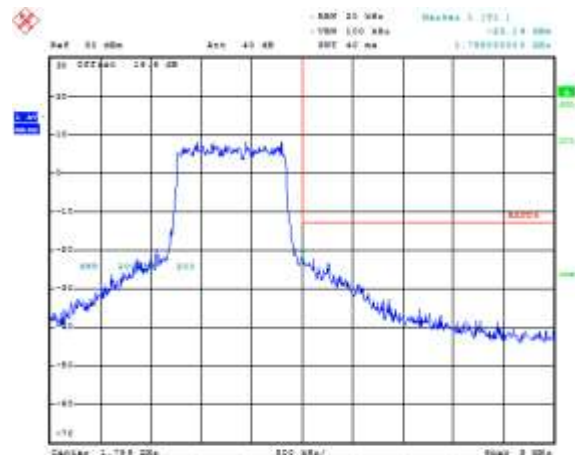
**Figure 5-40a: Band 4 High Channel Mask, 10MHz
BW, RB=50**




**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**



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 4 Conducted RF Emission Test Data cont'd

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

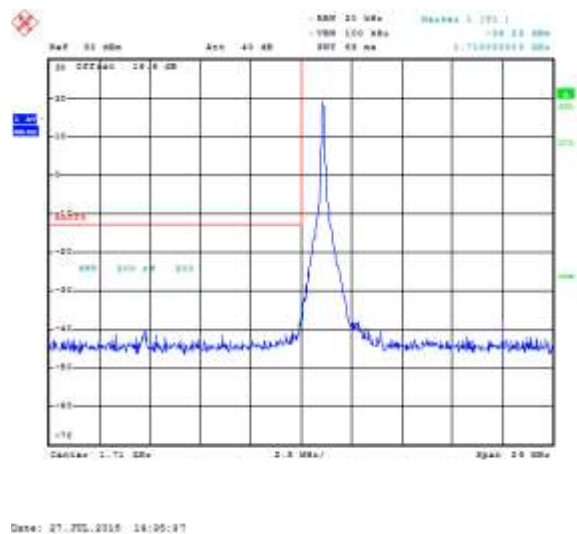


Figure 5-44a: Band 4 High Channel Mask, 20MHz BW, RB=1

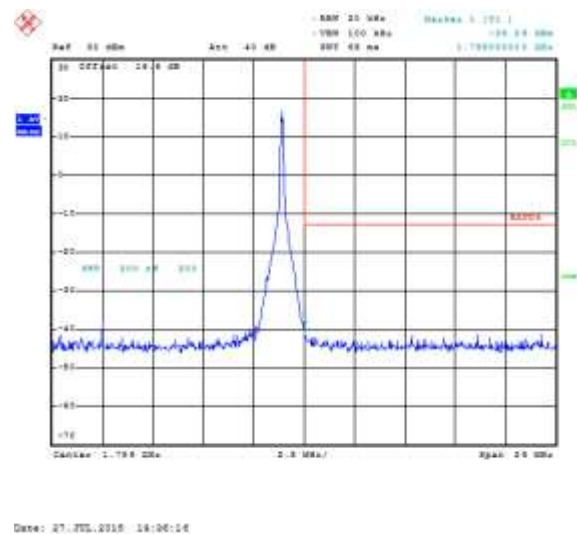


Figure 5-45a: Band 4 Mid Channel PAR, 20MHz BW, RB=50, QPSK

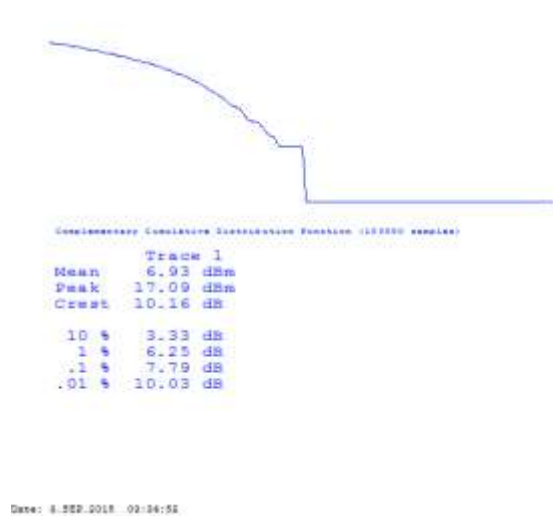
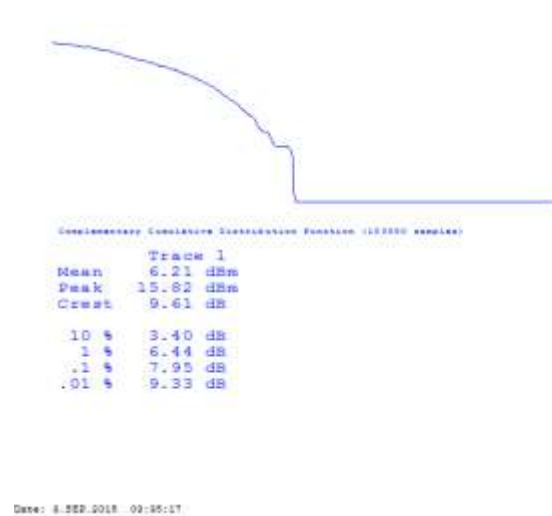



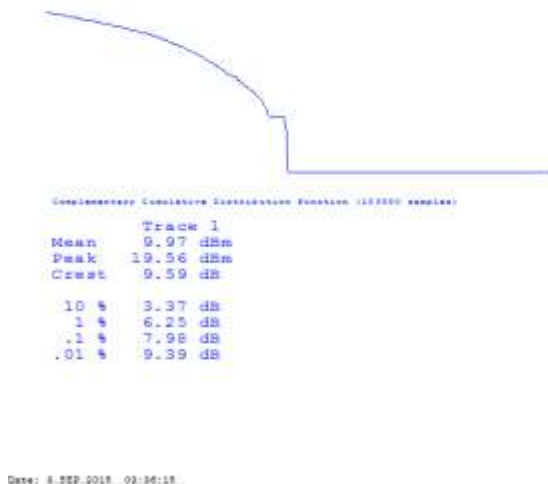
Figure 5-46a: Band 4 Middle Channel Mask, 20MHz BW, RB=100, 16-QAM



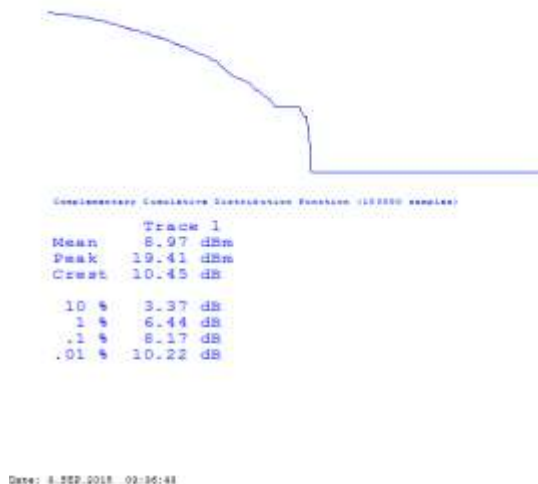
	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 5A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 4 Conducted RF Emission Test Data cont'd

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



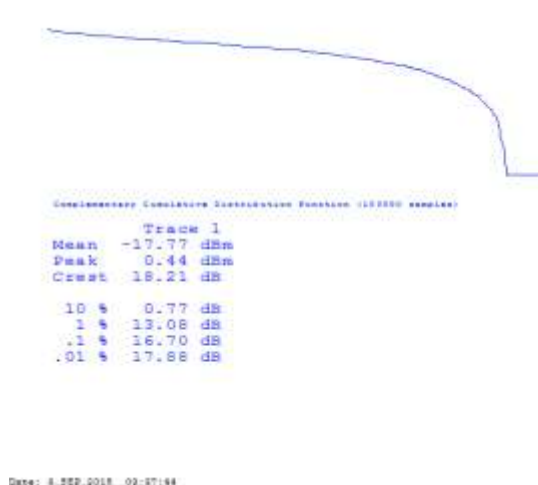
**Figure 5-48a: Band 4 Mid Channel PAR, 10MHz
BW, RB=50, 16-QAM**




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



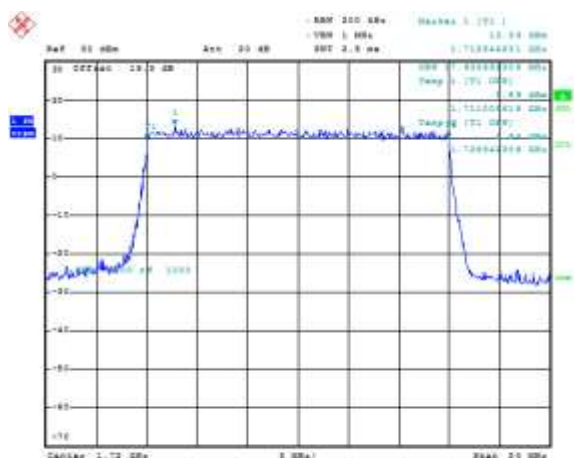
**Figure 5-50a: Band 4 Middle Channel Mask, 5MHz
BW, RB=6, 16-QAM**



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

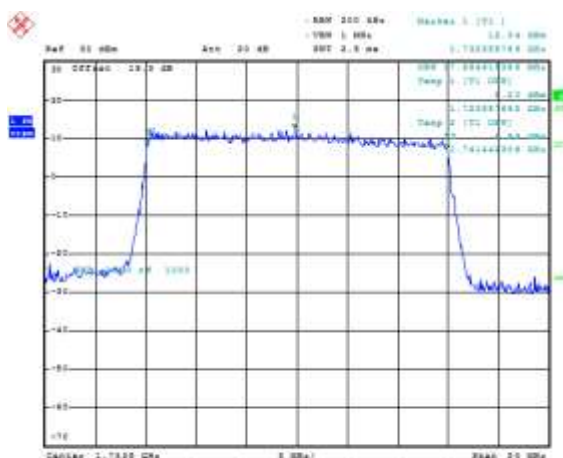
LTE Band 4 Conducted RF Emission Test Data cont'd

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



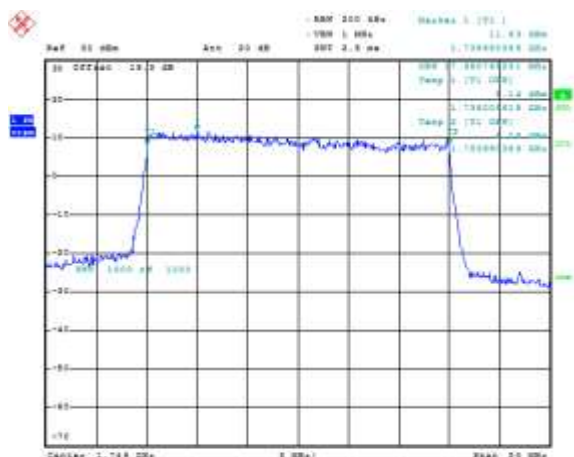
Date: 27.JUL.2015 11:48:00

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



Date: 27.JUL.2015 11:48:01

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

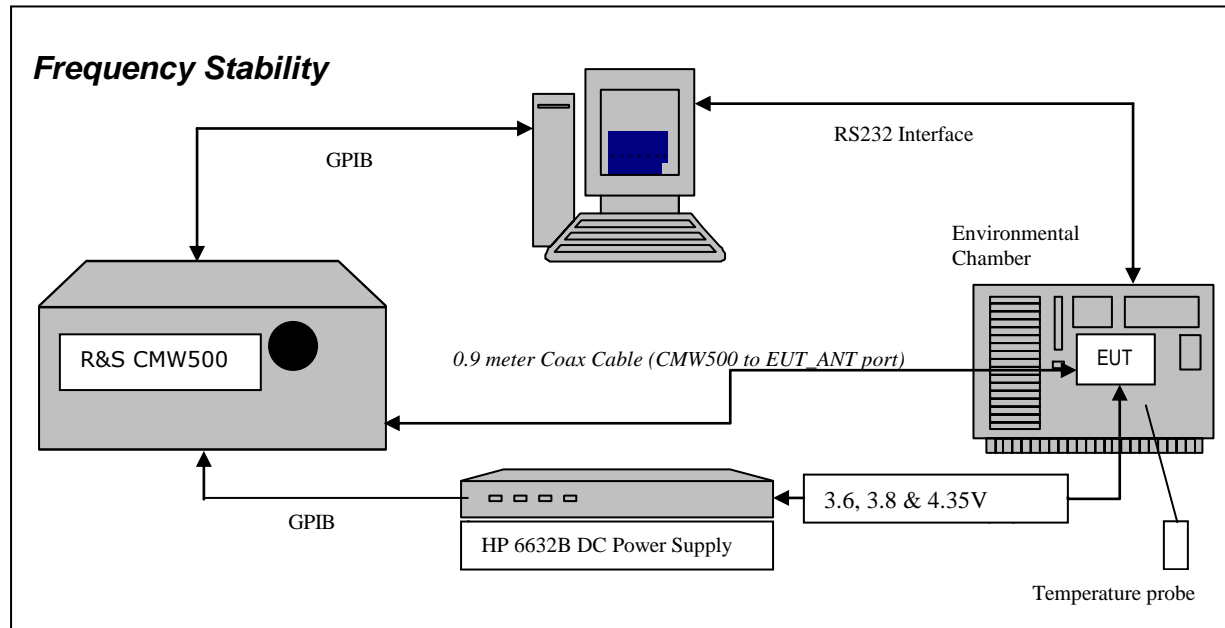


Date: 27.JUL.2015 11:48:04

APPENDIX 5B – LTE Band 4 FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 4 Frequency Stability Test Data



The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Landon Martin.

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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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 3.8 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 1720.0 MHz, 1732.5 MHz and 1745.0 MHz each was measured under 20 MHz bandwidth with maximum (100) RBs. 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


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 3.8 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, 3.8 and 4.35 volts

The maximum frequency error in the LTE band 4 measured was **0.0043 PPM**.


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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	6.04	0.0035
20175	1732.5	3.6	20	6.35	0.0037
20300	1745.0	3.6	20	-4.33	-0.0025


Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	3.8	20	4.86	0.0028
20175	1732.5	3.8	20	5.12	0.0030
20300	1745.0	3.8	20	-5.36	-0.0031

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	20	7.32	0.0043
20175	1732.5	4.35	20	5.21	0.0030
20300	1745.0	4.35	20	-5.04	-0.0029

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


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	5.55	0.0032
20050	1720.0	3.6	-20	5.94	0.0035
20050	1720.0	3.6	-10	5.99	0.0035
20050	1720.0	3.6	0	7.28	0.0042
20050	1720.0	3.6	10	6.24	0.0036
20050	1720.0	3.6	20	6.04	0.0035
20050	1720.0	3.6	30	5.39	0.0031
20050	1720.0	3.6	40	2.99	0.0017
20050	1720.0	3.6	50	5.08	0.0030
20050	1720.0	3.6	60	5.38	0.0031
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	3.8	-30	4.05	0.0024
20050	1720.0	3.8	-20	7.12	0.0041
20050	1720.0	3.8	-10	4.75	0.0028
20050	1720.0	3.8	0	4.72	0.0027
20050	1720.0	3.8	10	5.95	0.0035
20050	1720.0	3.8	20	4.86	0.0028
20050	1720.0	3.8	30	5.79	0.0034
20050	1720.0	3.8	40	6.64	0.0039
20050	1720.0	3.8	50	7.77	0.0045
20050	1720.0	3.8	60	5.92	0.0034
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20050	1720.0	4.35	-30	5.87	0.0034
20050	1720.0	4.35	-20	4.63	0.0027
20050	1720.0	4.35	-10	5.34	0.0031
20050	1720.0	4.35	0	3.95	0.0023
20050	1720.0	4.35	10	5.26	0.0031
20050	1720.0	4.35	20	7.32	0.0043
20050	1720.0	4.35	30	4.75	0.0028
20050	1720.0	4.35	40	6.11	0.0036
20050	1720.0	4.35	50	8.10	0.0047
20050	1720.0	4.35	60	3.92	0.0023

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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	7.22	0.0042
20175	1732.5	3.6	-20	4.92	0.0028
20175	1732.5	3.6	-10	4.68	0.0027
20175	1732.5	3.6	0	6.79	0.0039
20175	1732.5	3.6	10	4.39	0.0025
20175	1732.5	3.6	20	6.35	0.0037
20175	1732.5	3.6	30	3.75	0.0022
20175	1732.5	3.6	40	5.49	0.0032
20175	1732.5	3.6	50	-4.22	-0.0024
20175	1732.5	3.6	60	4.02	0.0023
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	3.8	-30	-3.58	-0.0021
20175	1732.5	3.8	-20	4.33	0.0025
20175	1732.5	3.8	-10	4.59	0.0027
20175	1732.5	3.8	0	4.82	0.0028
20175	1732.5	3.8	10	4.71	0.0027
20175	1732.5	3.8	20	5.12	0.0030
20175	1732.5	3.8	30	-5.58	-0.0032
20175	1732.5	3.8	40	4.36	0.0025
20175	1732.5	3.8	50	-4.05	-0.0023
20175	1732.5	3.8	60	4.19	0.0024
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20175	1732.5	4.35	-30	4.73	0.0027
20175	1732.5	4.35	-20	3.83	0.0022
20175	1732.5	4.35	-10	4.49	0.0026
20175	1732.5	4.35	0	5.21	0.0030
20175	1732.5	4.35	10	3.09	0.0018
20175	1732.5	4.35	20	5.21	0.0030
20175	1732.5	4.35	30	4.95	0.0029
20175	1732.5	4.35	40	-3.91	-0.0023
20175	1732.5	4.35	50	-3.02	-0.0017
20175	1732.5	4.35	60	4.72	0.0027

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 5B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE band 4 Results: channel 20300 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	3.6	-30	-5.85	-0.0034
20300	1745.0	3.6	-20	-4.26	-0.0024
20300	1745.0	3.6	-10	-4.79	-0.0027
20300	1745.0	3.6	0	3.26	0.0019
20300	1745.0	3.6	10	-3.73	-0.0021
20300	1745.0	3.6	20	-4.33	-0.0025
20300	1745.0	3.6	30	-5.68	-0.0033
20300	1745.0	3.6	40	-4.21	-0.0024
20300	1745.0	3.6	50	-7.24	-0.0041
20300	1745.0	3.6	60	-6.29	-0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	3.8	-30	-6.29	-0.0036
20300	1745.0	3.8	-20	-4.81	-0.0028
20300	1745.0	3.8	-10	3.66	0.0021
20300	1745.0	3.8	0	-2.78	-0.0016
20300	1745.0	3.8	10	-4.68	-0.0027
20300	1745.0	3.8	20	-5.36	-0.0031
20300	1745.0	3.8	30	-5.46	-0.0031
20300	1745.0	3.8	40	-6.47	-0.0037
20300	1745.0	3.8	50	-4.45	-0.0025
20300	1745.0	3.8	60	-5.82	-0.0033
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
20300	1745.0	4.35	-30	-6.14	-0.0035
20300	1745.0	4.35	-20	-5.68	-0.0033
20300	1745.0	4.35	-10	-2.78	-0.0016
20300	1745.0	4.35	0	-2.78	-0.0016
20300	1745.0	4.35	10	-3.46	-0.0020
20300	1745.0	4.35	20	-5.04	-0.0029
20300	1745.0	4.35	30	-5.51	-0.0032
20300	1745.0	4.35	40	-4.86	-0.0028
20300	1745.0	4.35	50	-4.46	-0.0026
20300	1745.0	4.35	60	-7.71	-0.0044

APPENDIX 5C – LTE Band 4 RADIATED EMISSIONS TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 5C	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Radiated Power Test Data Results

The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Savtej Sandhu.

Date of Test: July 23, 2015

The environmental tests conditions were: Temperature: 24.1 °C

Relative Humidity: 34.2 %

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

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

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

LTE band 4, 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 Isotropic Radiator)		Limit (dBm)	Diff to Limit (dB)
										(dBm)	(W)		
F0	20000	1715.00	4	Horn	V	-21.34	-21.34	V-V	-13.41	25.78	0.38	30.00	4.22
F0	20000	1715.00	4	Horn	H	-23.07		H-H	-12.86				
F0	20175	1732.50	4	Horn	V	-21.74	-21.74	V-V	-13.50	25.94	0.39	30.00	4.06
F0	20175	1732.50	4	Horn	H	-23.31		H-H	-12.85				
F0	20349	1749.90	4	Horn	V	-22.25	-22.25	V-V	-13.43	25.79	0.38	30.00	4.21
F0	20349	1749.90	4	Horn	H	-22.70		H-H	-12.81				

LTE band 4, 10MHz BW, RB=1, 16-QAM modulation

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
		Frequency				Reading	Max (V,H)	Pol.	Reading	Corrected Reading (relative to Isotropic Radiator)		Limit	Diff to Limit
Type	Ch	(MHz)	Band	Type	Pol.	(dBuV)	(dBuV)	Tx-Rx	(dBm)	(dBm)	(W)	(dBm)	(dB)
F0	20000	1715.00	4	Horn	V	-21.99	-21.99	V-V	-14.01	25.11	0.32	30.00	4.89
F0	20000	1715.00	4	Horn	H	-23.98		H-H	-13.53				
F0	20175	1732.50	4	Horn	V	-22.71	-22.71	V-V	-14.53	24.95	0.31	30.00	5.05
F0	20175	1732.50	4	Horn	H	-23.95		H-H	-13.84				
F0	20349	1749.90	4	Horn	V	-23.19	-23.19	V-V	-14.50	24.89	0.31	30.00	5.11
F0	20349	1749.90	4	Horn	H	-23.75		H-H	-13.71				

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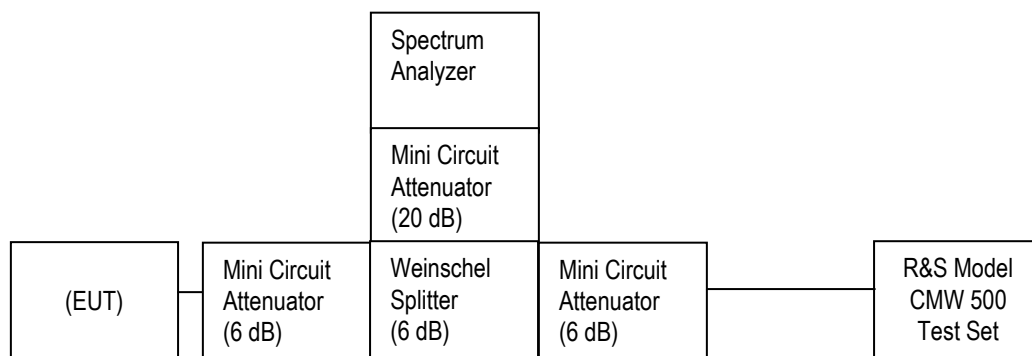
APPENDIX 6A– LTE Band 12 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Conducted RF Emission Test Data

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

Test Setup Diagram




The following configurations were measured for model RHK211LW (STV100-1):

Date of Test: July 27 – September 3, 2015

The environmental test conditions were: Temperature: 22.7 – 23.6 °C
 Relative Humidity: 38.7 – 61.2 %

The following measurements were performed by Sijia Li and Landon Martin.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Conducted RF Emission Test Data cont'd

Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)	Emission Designator	Band	Bandwidth (MHz)	Modulation
701.5-713.5	22.74	0.19	4M50G7D	LTE B12	5	QPSK
701.5-713.5	22.45	0.18	4M48D7W	LTE B12	5	16QAM
704.0-711.0	22.72	0.19	8M97G7D	LTE B12	10	QPSK
704.0-711.0	22.55	0.18	8M94D7W	LTE B12	10	16QAM

The conducted spurious emissions – As per 47 CFR 2.202, 2.1046, 27.53, 27.54, 27.50 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 RBs for LTE Band 12.


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

A minimum RB 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 12 was measured to be 9.22 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Test Data for LTE Band 12 selected Frequencies in 10MHz BW (RB = 50)

LTE Band 12 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
707.5	9.22	8.966

Test Data for LTE Band 12 selected Frequencies in 5MHz BW (RB = 25)


LTE Band 12 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
704	4.635	4.495
707.5	4.64	4.471
711	4.615	4.495

Test Data for LTE Band 12 selected Frequencies in 3MHz BW (RB =15)

LTE Band 17 Frequency (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	16-QAM
700.5	2.70	2.69
707.5	2.69	2.68
714.5	2.70	2.69

Test Data for LTE Band 12 selected Frequencies in 1.4MHz BW (RB =6)

LTE Band 17 Frequency (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	16-QAM
706	1.09	1.08
707.5	1.10	1.09
709	1.09	1.09

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Peak to Average Ratio (PAR)

For each 5MHz and 10MHz with Resource Block allocation 50,25 and 15 as per scalable bandwidths for LTE band 12, 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 9.61 dB on 10MHz bandwidth with Resource Block allocation 25 while transmitting at 707.5MHz.


Measurement Plots for LTE Band 12

See Figures 6-1a to 6-8a for the plots of the conducted spurious emissions.

See Figures 6-9a to 6-16a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

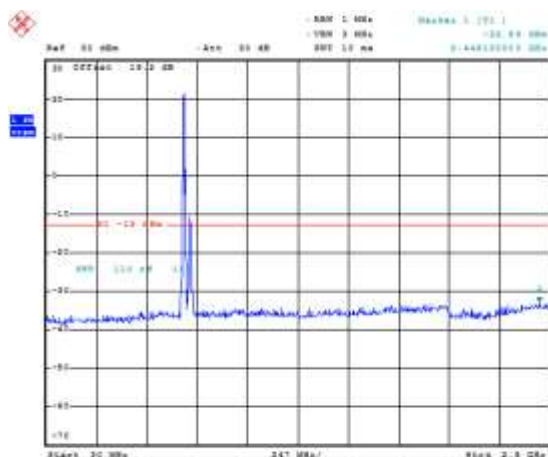
See Figures 6-17a to 6-21a for the plots of the Channel mask.

See Figures 6-22a for the plots of the Peak to Average Ratio.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

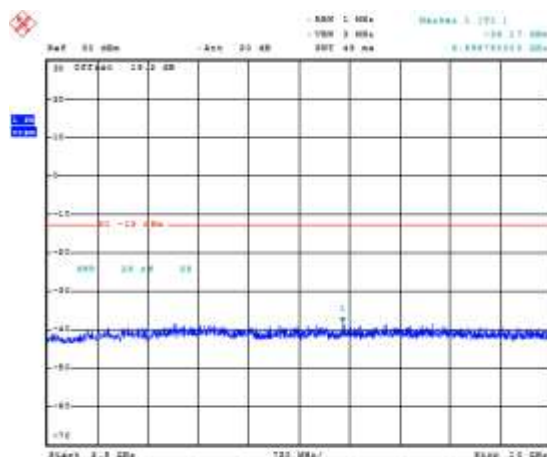
LTE Band 12 Conducted RF Emission Test Data cont'd

Figure 3-1a: Band 12, Spurious Conducted Emissions, 10MHz BW (RB= 50)



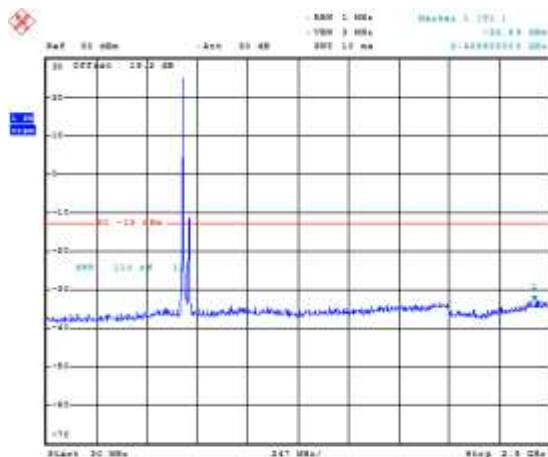
Date: 27.JUL.2015 08:29:02

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



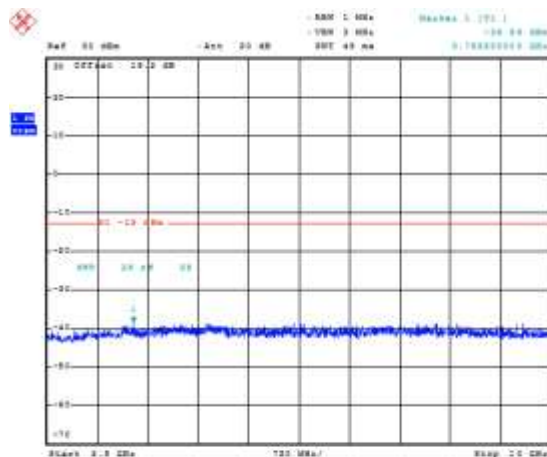
Date: 27.JUL.2015 08:29:06

Figure 3-3a: Band 12, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)




Date: 27.JUL.2015 08:01:46

Figure 3-4a: Band 12, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)

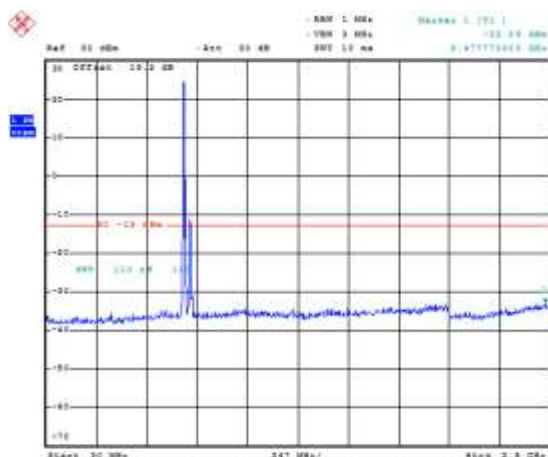


Date: 27.JUL.2015 08:01:59

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

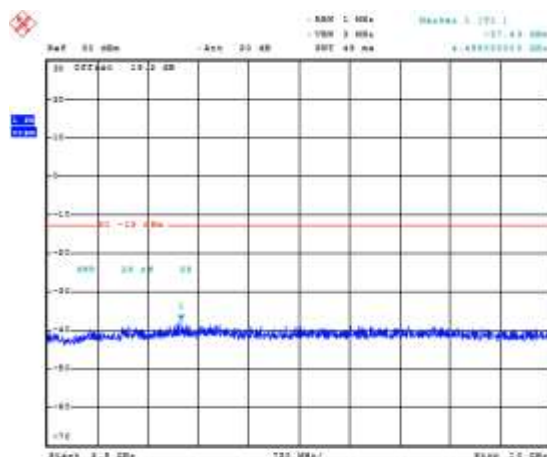
LTE Band 12 Conducted RF Emission Test Data cont'd

Figure 3-5a: Band 12, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 25)



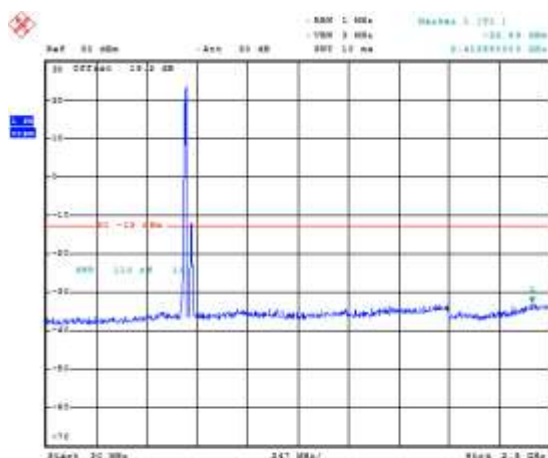
Date: 27-Jul-2015 08:00:00

Figure 3-6a: Band 12, Spurious Conducted Emissions, High Channel, 5MHz BW (RB= 25)



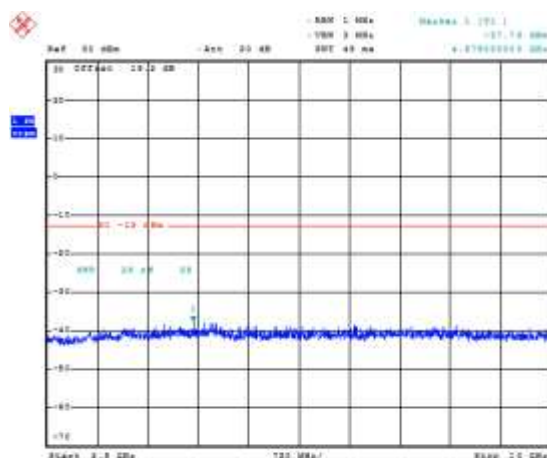
Date: 27-Jul-2015 08:00:17

Figure 3-7a: Band 12, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)




Date: 27-Jul-2015 08:04:11

Figure 3-8a: Band 12, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)

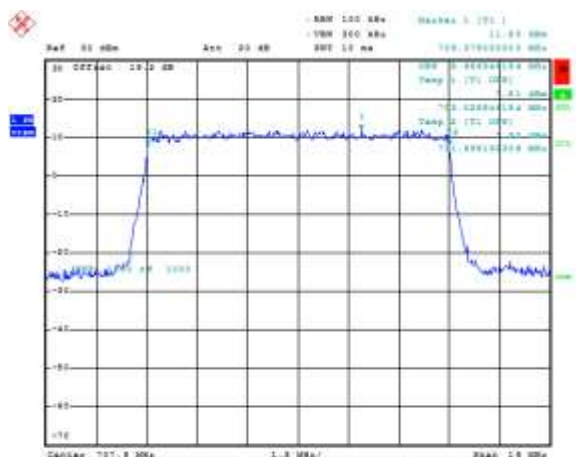


Date: 27-Jul-2015 08:04:29

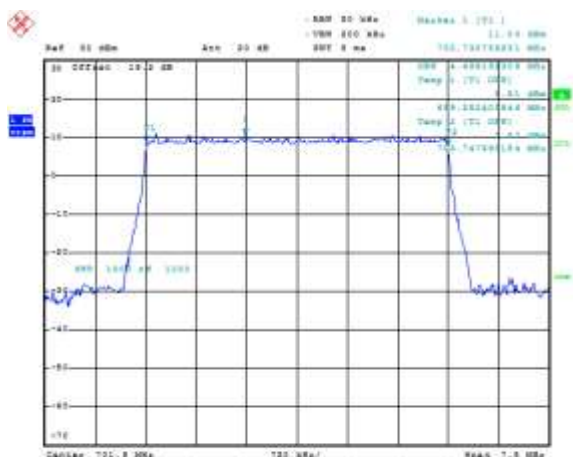
	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Conducted RF Emission Test Data cont'd

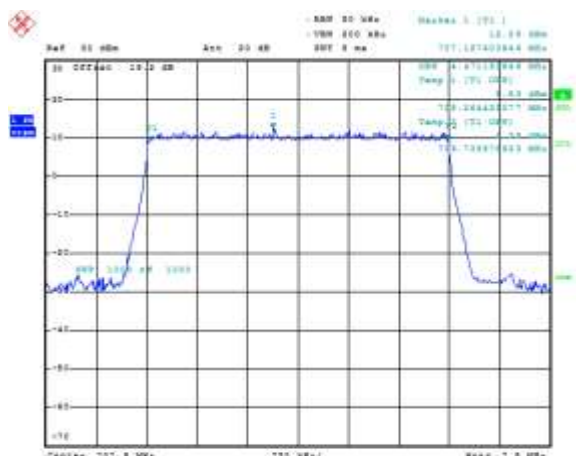
**Figure 3-9a: Occupied Bandwidth, Band 12
10MHz BW, RB=50**



**Figure 3-10a: Occupied Bandwidth, Band 5 Low
Channel, 5MHz BW, RB=25**




**Figure 3-11a: Occupied Bandwidth, Band 5 Middle
Channel, 5MHz BW, RB=25**



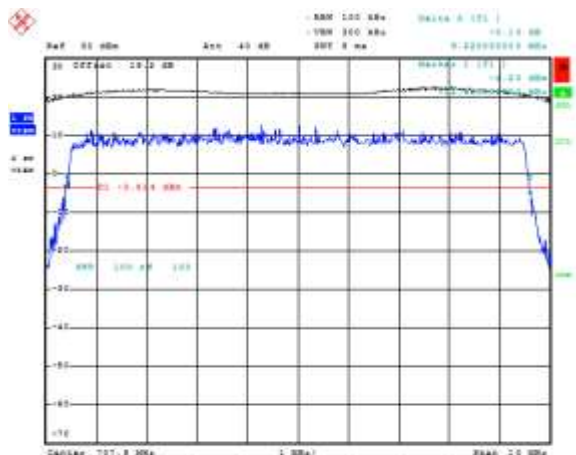
**Figure 3-12a: Occupied Bandwidth, Band 5 High
Channel, 5MHz BW, RB=25**



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

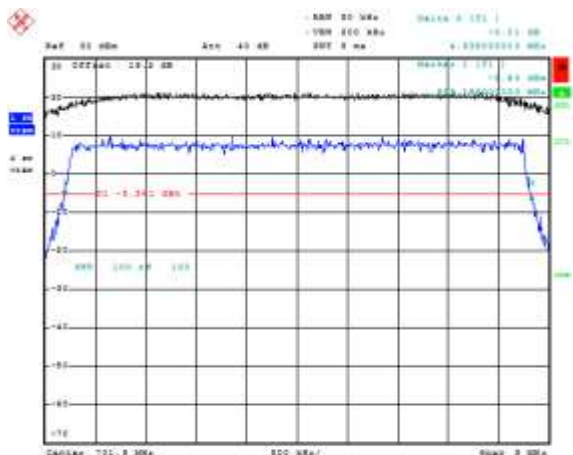
LTE Band 12 Conducted RF Emission Test Data cont'd

Figure 3-13a: -26 dBc Bandwidth, Band 12 Middle Channel, 10MHz BW, RB=50



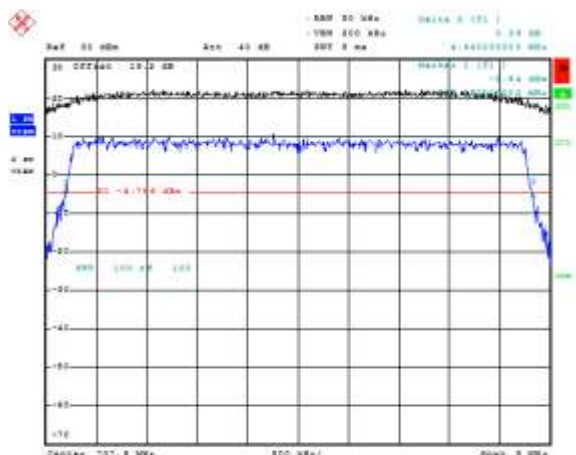
Date: 27-JUL-2015 17:22:18

Figure 3-14a: -26 dBc Bandwidth, Band 12 Low Channel, 5MHz BW, RB=25



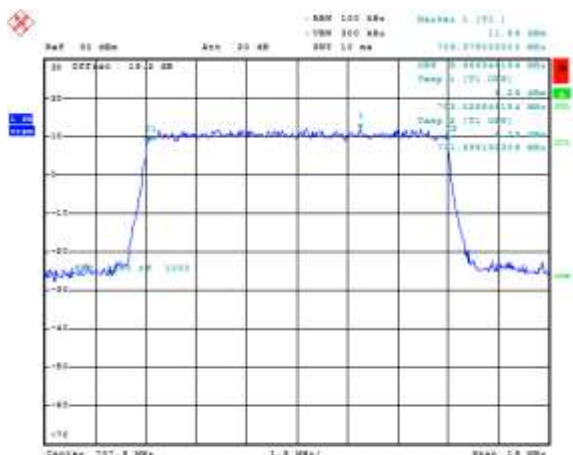
Date: 27-JUL-2015 17:22:58

Figure 3-15a: -26 dBc Bandwidth, Band 12 Middle Channel, 5MHz BW, RB=25




Date: 27-JUL-2015 17:29:07

Figure 3-16a: -26 dBc Bandwidth, Band 12 High Channel, 5MHz BW, RB=25



Date: 27-JUL-2015 17:40:56

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Conducted RF Emission Test Data cont'd

Figure 3-17a: Band 12 Channel Mask, 10MHz BW, RB=50

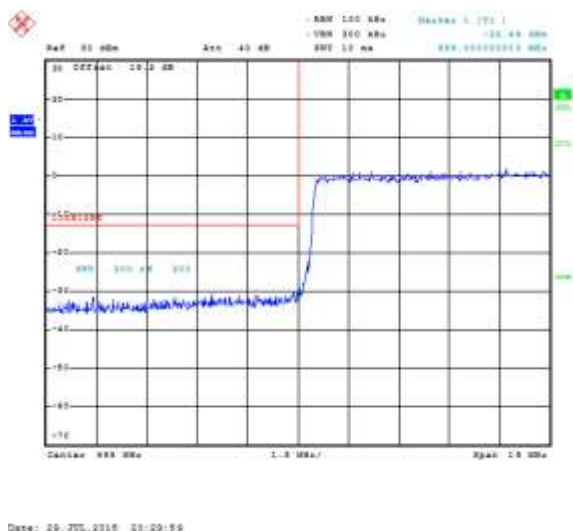


Figure 3-17a: Band 12 Channel Mask, 10MHz BW, RB=50

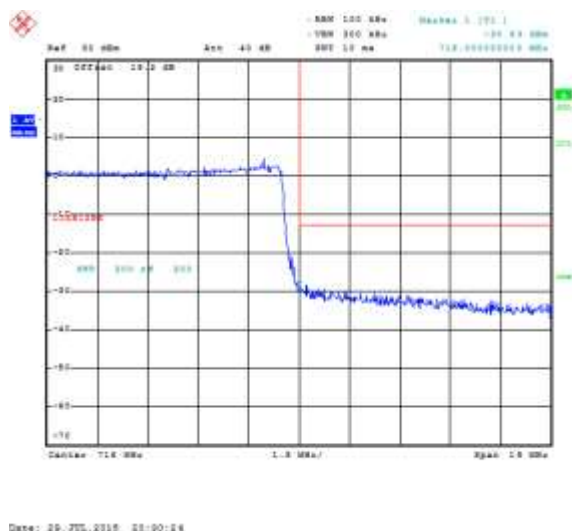


Figure 3-18a: Band 12 Low Channel Mask, 5MHz BW, RB=1

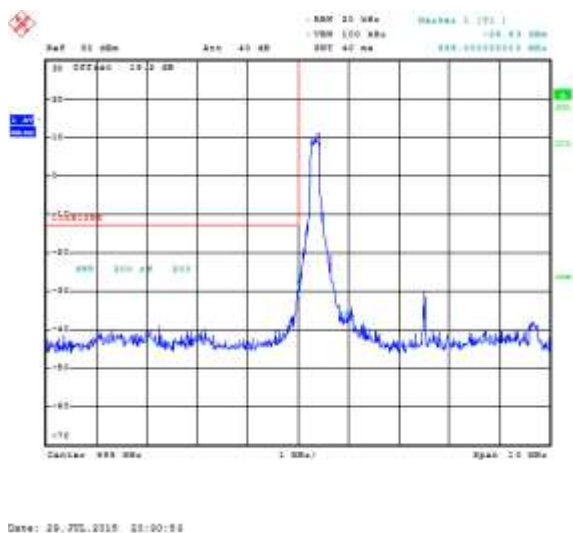
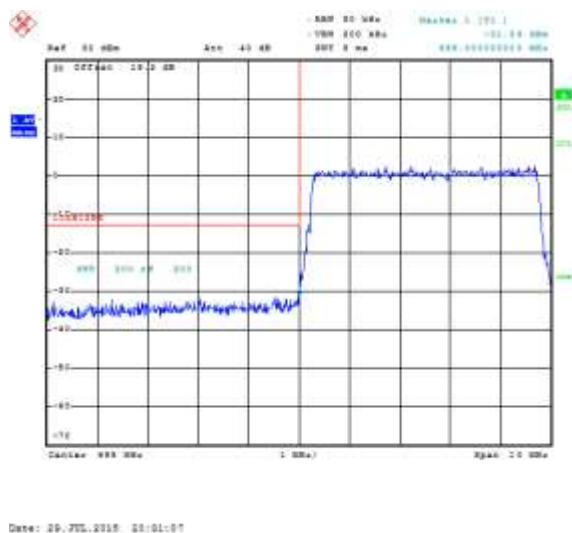



Figure 3-19a: Band 12 Low Channel Mask, 5MHz BW, RB=25



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Conducted RF Emission Test Data cont'd

Figure 3-20a: Band 12 High Channel Mask, 5MHz BW, RB=1

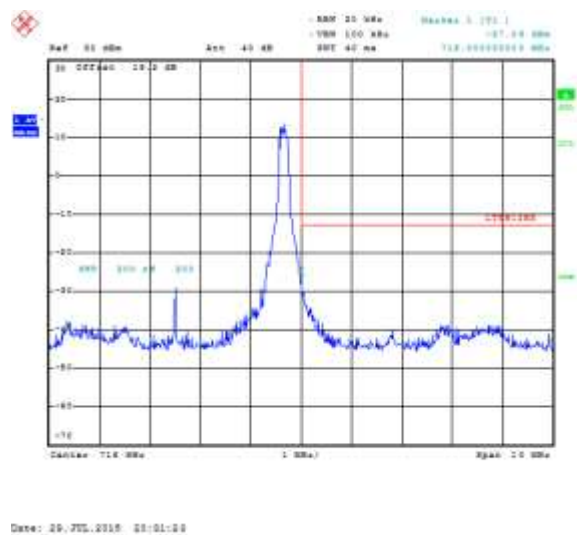


Figure 3-21a: Band 12 High Channel Mask, 5MHz BW, RB=25

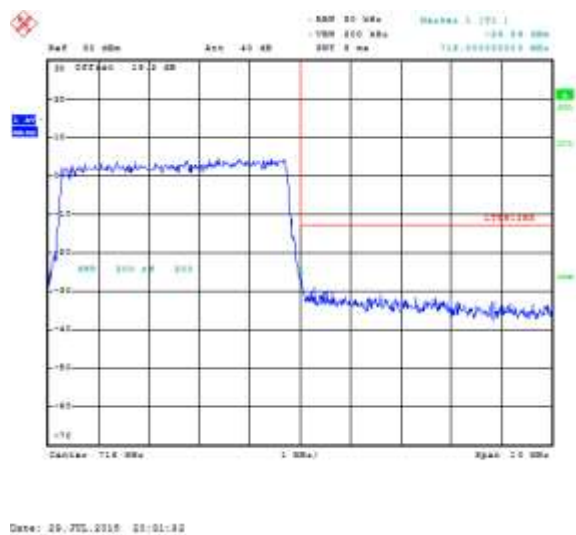
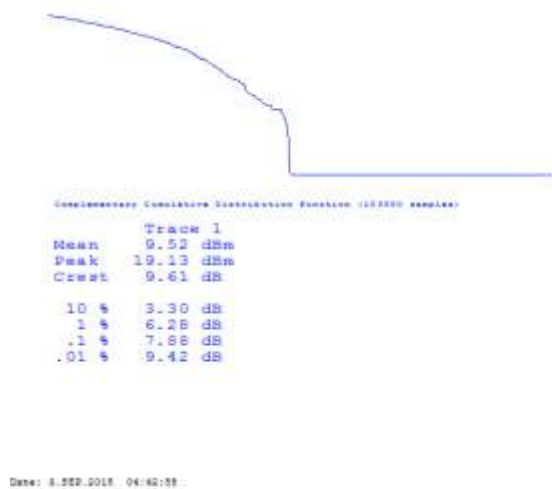


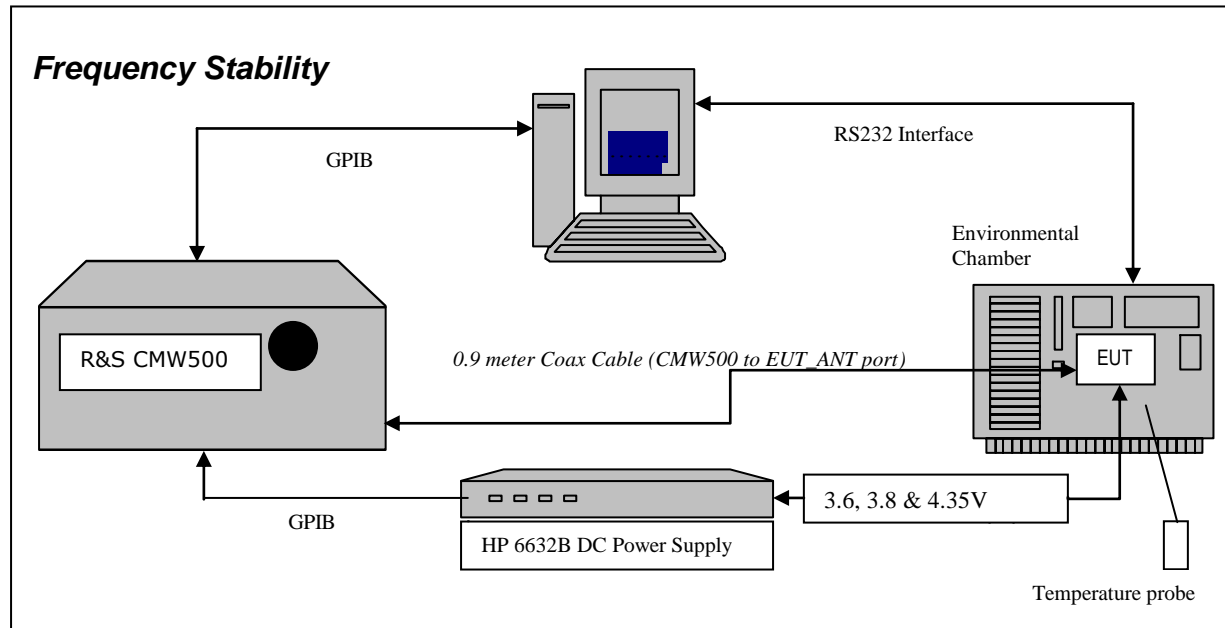
Figure 3-22a: Band 12 PAR, 10MHz BW, RB=25



APPENDIX 6B – LTE Band 12 FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Frequency Stability Test Data



The following measurements were performed by Sijia Li.

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, 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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, 3.8 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 volts and 4.35 volts. The transmit frequency was measured on 782MHz for 10MHz bandwidth with maximum (50) RB. The transmit frequency was varied in 3 steps consisting of 779.5 MHz, 782.0 MHz and 784.5 MHz each was measured under 5 MHz bandwidth with maximum (25) RBs. 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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 3.8 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, 3.8 and 4.35 volts

The following configurations were measured for model RHK211LW (STV100-1):

The maximum frequency error in the LTE Band 12 measured was **0.0058 PPM**.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

The following configurations were measured for model RHK211LW (STV100-1):


Date of test: April 25, 2015

**LTE Band 12 results (10MHz Bandwidth): channels 23060, 23095 and 23129 @ 20°C
maximum transmitted power**

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	3.6	20	-3.09	-0.0044
23095	707.5	3.6	20	3.85	0.0054
23129	710.9	3.6	20	3.85	0.0054

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	3.8	20	3.68	0.0052
23095	707.5	3.8	20	4.09	0.0058
23129	710.9	3.8	20	3.30	0.0046

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	4.35	20	3.45	0.0049
23095	707.5	4.35	20	3.86	0.0055
23129	710.9	4.35	20	3.78	0.0053


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Results (10MHz Bandwidth): channel 23060 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	3.6	-30	-2.37	-0.0034
23060	704	3.6	-20	2.52	0.0036
23060	704	3.6	-10	3.45	0.0049
23060	704	3.6	0	4.68	0.0066
23060	704	3.6	10	2.69	0.0038
23060	704	3.6	20	-3.09	-0.0044
23060	704	3.6	30	3.63	0.0052
23060	704	3.6	40	-3.82	-0.0054
23060	704	3.6	50	-3.81	-0.0054
23060	704	3.6	60	-3.03	-0.0043

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	3.8	-30	1.97	0.0028
23060	704	3.8	-20	3.46	0.0049
23060	704	3.8	-10	3.39	0.0048
23060	704	3.8	0	1.65	0.0023
23060	704	3.8	10	-2.90	-0.0041
23060	704	3.8	20	3.68	0.0052
23060	704	3.8	30	2.57	0.0037
23060	704	3.8	40	-2.53	-0.0036
23060	704	3.8	50	-2.22	-0.0031
23060	704	3.8	60	-2.88	-0.0041

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23060	704	4.35	-30	-2.99	-0.0042
23060	704	4.35	-20	-2.79	-0.0040
23060	704	4.35	-10	2.99	0.0042
23060	704	4.35	0	1.66	0.0024
23060	704	4.35	10	-2.22	-0.0031
23060	704	4.35	20	3.45	0.0049
23060	704	4.35	30	-5.18	-0.0074
23060	704	4.35	40	-3.05	-0.0043
23060	704	4.35	50	2.06	0.0029
23060	704	4.35	60	3.25	0.0046

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


**LTE Band 12 Results(5MHz Bandwidth): channel 23095 @ maximum transmitted power
(cont'd)**

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23095	707.5	3.6	-30	3.58	0.0051
23095	707.5	3.6	-20	3.73	0.0053
23095	707.5	3.6	-10	3.13	0.0044
23095	707.5	3.6	0	1.92	0.0027
23095	707.5	3.6	10	3.65	0.0052
23095	707.5	3.6	20	3.85	0.0054
23095	707.5	3.6	30	2.93	0.0041
23095	707.5	3.6	40	-4.11	-0.0058
23095	707.5	3.6	50	-3.08	-0.0043
23095	707.5	3.6	60	-3.60	-0.0051

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23095	707.5	3.8	-30	2.23	0.0032
23095	707.5	3.8	-20	-2.55	-0.0036
23095	707.5	3.8	-10	3.42	0.0048
23095	707.5	3.8	0	3.10	0.0044
23095	707.5	3.8	10	-2.57	-0.0036
23095	707.5	3.8	20	4.09	0.0058
23095	707.5	3.8	30	2.63	0.0037
23095	707.5	3.8	40	-3.30	-0.0047
23095	707.5	3.8	50	1.90	0.0027
23095	707.5	3.8	60	-3.39	-0.0048

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23095	707.5	4.35	-30	-4.28	-0.0060
23095	707.5	4.35	-20	-2.80	-0.0040
23095	707.5	4.35	-10	2.00	0.0028
23095	707.5	4.35	0	5.01	0.0071
23095	707.5	4.35	10	-2.52	-0.0036
23095	707.5	4.35	20	3.86	0.0055
23095	707.5	4.35	30	2.79	0.0039
23095	707.5	4.35	40	-4.03	-0.0057
23095	707.5	4.35	50	-3.22	-0.0045
23095	707.5	4.35	60	1.97	0.0028

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	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 Results(5MHz Bandwidth): channel 23129 @ maximum transmitted power


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23129	710.9	3.6	-30	3.83	0.0054
23129	710.9	3.6	-20	3.81	0.0054
23129	710.9	3.6	-10	3.46	0.0049
23129	710.9	3.6	0	-2.20	-0.0031
23129	710.9	3.6	10	3.56	0.0050
23129	710.9	3.6	20	3.85	0.0054
23129	710.9	3.6	30	2.46	0.0035
23129	710.9	3.6	40	-3.09	-0.0043
23129	710.9	3.6	50	-2.13	-0.0030
23129	710.9	3.6	60	-3.35	-0.0047

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23129	710.9	3.8	-30	2.16	0.0030
23129	710.9	3.8	-20	-3.91	-0.0055
23129	710.9	3.8	-10	3.00	0.0042
23129	710.9	3.8	0	-1.69	-0.0024
23129	710.9	3.8	10	-2.92	-0.0041
23129	710.9	3.8	20	3.30	0.0046
23129	710.9	3.8	30	-3.00	-0.0042
23129	710.9	3.8	40	-2.99	-0.0042
23129	710.9	3.8	50	1.80	0.0025
23129	710.9	3.8	60	-2.96	-0.0042

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23129	710.9	4.35	-30	-3.25	-0.0046
23129	710.9	4.35	-20	-2.39	-0.0034
23129	710.9	4.35	-10	2.83	0.0040
23129	710.9	4.35	0	4.61	0.0065
23129	710.9	4.35	10	3.56	0.0050
23129	710.9	4.35	20	3.78	0.0053
23129	710.9	4.35	30	2.02	0.0028
23129	710.9	4.35	40	3.75	0.0053
23129	710.9	4.35	50	-2.76	-0.0039
23129	710.9	4.35	60	-2.70	-0.0038

Procedure for IC:


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	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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. Using a resolution bandwidth equal to that permitted within the 1MHz band immediately outside the channel edge, reference points will be selected at the unwanted emission levels which comply with the attenuation $43 + 10 \log_{10} p$, for the type of device under test, on the emission mask of the lowest and highest channels, and the frequency at these points shall be recorded as fL and fH respectively.
11. The frequency stability is calculated by fL minus the frequency offset (frequency error measured in step 9) and fH plus the frequency offset shall be within the frequency range that the equipment is designed to operate (2.5 to 2.57 GHz).
12. The CMW 500 commands the EUT to change frequency to the high channel and repeats steps 7 to 11.
13. Repeat steps 5 to 12 changing the supply voltage to 3.8 Volts
14. Increase temperature to 20 and 50°C and soak for 1/2 hour.
15. Repeat steps 4 - 14 for temperatures –30°C to 60°C.
16. Repeat steps 5 to 15 changing the supply voltage to 4.35 volts

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

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Date of test: Sept 2, 2015.


IC RSS – 130, 4.3 LTE Band 12 Frequency Stability.

LTE Band 12 10MHz Bandwidth results: channels 23060, & 23129 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Band 12 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH+Freq Offset (MHz)
23060	704	3.6	20	-2.489	700.585	N/A	700.585	N/A
23129	710.9	3.6	20	-3.576	N/A	713.980	N/A	713.980

Traffic Channel Number	LTE Band 12 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH+Freq Offset (MHz)
23060	704	3.8	20	-2.074	700.585	N/A	700.585	N/A
23129	710.9	3.8	20	2.661	N/A	714.205	N/A	714.205


Traffic Channel Number	LTE Band 12 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH+Freq Offset (MHz)
23060	704	4.35	20	-3.204	700.705	N/A	700.705	N/A
23129	710.9	4.35	20	-3.018	N/A	714.340	N/A	714.340

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 12 10MHz Bandwidth results: channels 23060, & 23129 @ -30 and +60°C maximum transmitted power

Traffic Channel Number	LTE Band 12 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH-Freq Offset (MHz)
23060	704	3.6	-30	2.346	700.615	N/A	700.615	N/A
23129	710.9	3.6	-30	-2.460	N/A	711.055	N/A	711.055
23060	704	3.8	-30	2.632	700.600	N/A	700.600	N/A
23129	710.9	3.8	-30	3.390	N/A	713.710	N/A	713.710
23060	704	4.35	-30	2.918	700.600	N/A	700.600	N/A
23129	710.9	4.35	-30	-2.832	N/A	711.760	N/A	711.760
23060	704	3.6	60	-3.076	700.600	N/A	700.600	N/A
23129	710.9	3.6	60	2.317	N/A	714.340	N/A	714.340
23060	704	3.8	60	-3.004	700.600	N/A	700.600	N/A
23129	710.9	3.8	60	-2.875	N/A	714.325	N/A	714.325
23060	704	4.35	60	2.146	700.570	N/A	700.570	N/A
23129	710.9	4.35	60	-2.460	N/A	714.265	N/A	714.265

APPENDIX 6C – LTE Band 12 RADIATED EMISSIONS TEST DATA

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 6C		
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW	

Radiated Power Test Data Results

The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Shiva Kumbham.

Date of Test: August 11, 2015

The environmental tests conditions were: Temperature: 25.5 °C

Relative Humidity: 35.6 %

The BlackBerry® smartphone was standalone, with horizontal top pointing up 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 3-4 meters height.

LTE Band 12, 5MHz BW, RB=1, QPSK modulation

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max	Pol.	Reading	Corrected Reading		Limit	Diff. To
		(MHz)				(dBm)	(V,H)			(dBm)	Tx-Rx		
F0	23035	701.50	12	Dipole	V	-45.71	-30.66	V-V	1.94	20.23	0.11	35.00	14.77
F0	23035	701.50	12	Dipole	H	-30.66		H-H	-0.54				
F0	23095	707.50	12	Dipole	V	-45.24	-29.38	V-V	3.16	21.48	0.14	35.00	13.52
F0	23095	707.50	12	Dipole	H	-29.38		H-H	0.60				
F0	23154	713.40	12	Dipole	V	-45.39	-29.22	V-V	3.91	22.17	0.16	35.00	12.83
F0	23154	713.40	12	Dipole	H	-29.22		H-H	0.97				

LTE Band 12, 5MHz BW, RB=1, 16QAM modulation

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading	Max	Pol.	Reading	Corrected Reading		Limit	Diff. To
		(MHz)				(dBm)	(V,H)			(dBm)	Tx-Rx		
F0	23060	704.00	12	Dipole	V	-45.99	-30.80	V-V	1.56	19.85	0.10	35.00	15.15
F0	23060	704.00	12	Dipole	H	-30.80		H-H	-0.80				
F0	23095	707.50	12	Dipole	V	-45.53	-30.25	V-V	2.23	20.55	0.11	35.00	14.45
F0	23095	707.50	12	Dipole	H	-30.25		H-H	-0.28				
F0	23129	710.90	12	Dipole	V	-45.86	-30.06	V-V	2.88	21.14	0.13	35.00	13.86
F0	23129	710.90	12	Dipole	H	-30.06		H-H	0.01				

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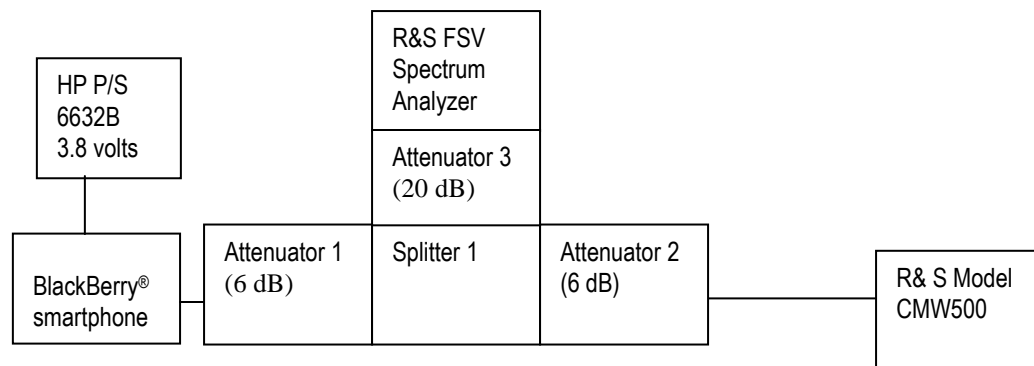
APPENDIX 7A– LTE Band 17 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 Conducted RF Emission Test Data

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

Test Setup Diagram



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


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

The following configurations were measured for model RHK211LW (STV100-1):

Date of Test: July 27 to September 3, 2015.

The environmental test conditions were: Temperature: 21.9 – 24.3°C
 Relative Humidity: 38.7 – 61.60%

The following measurements were performed by Sijia Li and Landon Martin.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 Conducted RF Emission Test Data cont'd

Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)	Emission Designator	Band	Bandwidth (MHz)	Modulation
706.5-713.5	22.69	0.19	4M49G7D	LTE B17	5	QPSK
706.5-713.5	21.79	0.15	4M48D7W	LTE B17	5	16QAM
709-711	22.78	0.19	8M97G7D	LTE B17	10	QPSK
709-711	22.56	0.18	8M99D7W	LTE B17	10	16QAM

The conducted spurious emissions – As per 47 CFR 2.202, 2.1046, 27.53, 27.54, 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 Resource Block allocations 50 and 25 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.

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 9.26MHz. 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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	9.2	8.966	8.966
710.0	9.2	8.966	8.966
711.0	9.26	8.966	8.990

Test Data for LTE Band 17 selected Frequencies in 5MHz BW (RB = 25)

LTE Band 17 Frequency (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	16-QAM
706.5	4.483	4.483
710	4.483	4.483
713.5	4.495	4.483

Peak to Average Ratio (PAR)

For each 5MHz and 10MHz with Resource Block allocations 50,25 and 15 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 8.05 dB on in 10MHz bandwidth with Resource Block allocation 25.

Measurement Plots for LTE Band 17

See Figures 7-1a to 7-12a for the plots of the conducted spurious emissions.

See Figures 7-19a to 7-24a and 7-37a to 7-39a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

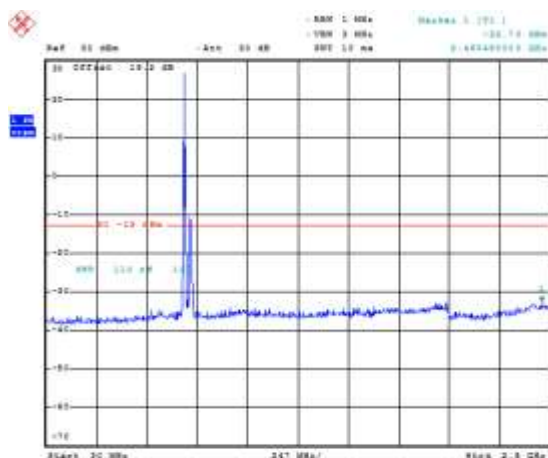
See Figures 7-25a to 7-32a for the plots of the Channel mask.

See Figures 7-33a to 7-36a for the plots of the Peak to Average Ratio.

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

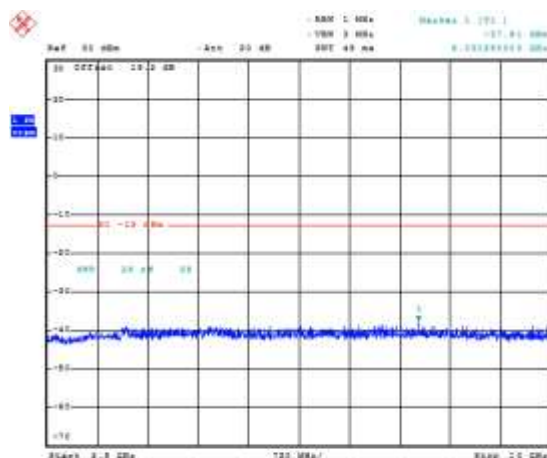
LTE Band 17 Conducted RF Emission Test Data cont'd

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



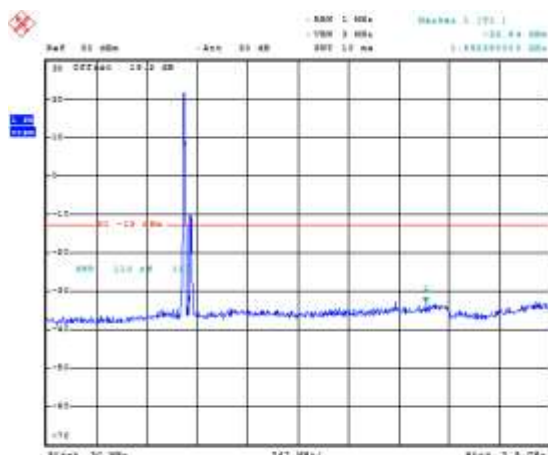
Date: 27-JUL-2015 05:14:29

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



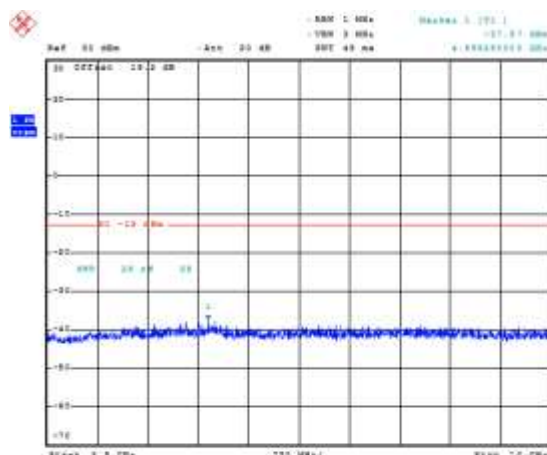
Date: 27-JUL-2015 05:14:42

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




Date: 27-JUL-2015 05:15:46

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

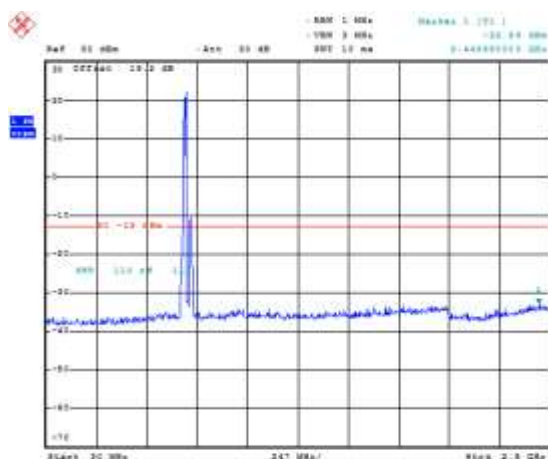


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	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

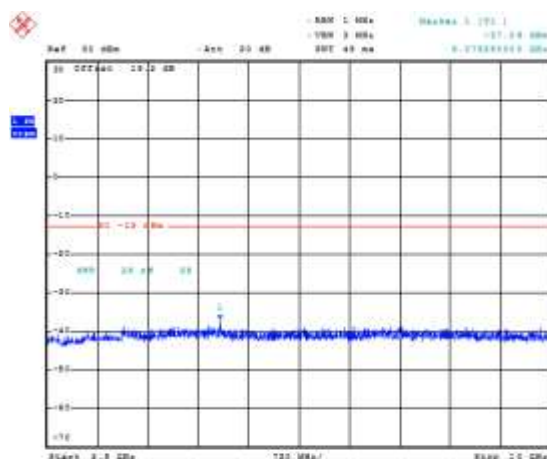
LTE Band 17 Conducted RF Emission Test Data cont'd

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



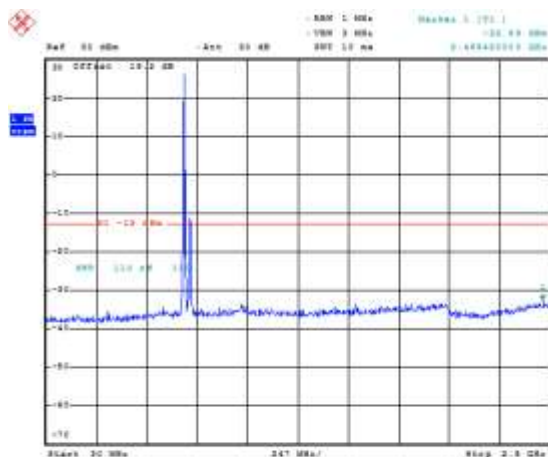
Date: 27-Jul-2015 08:17:04

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



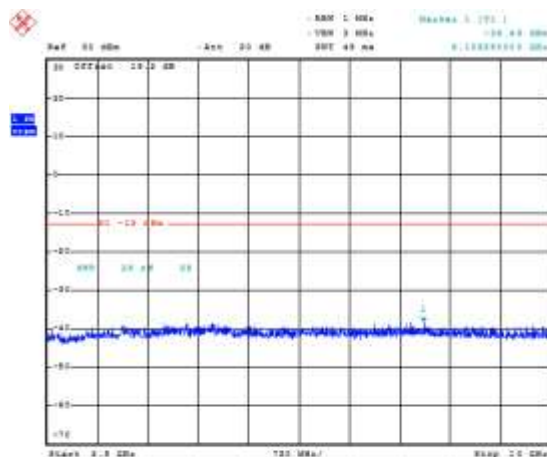
Date: 27-Jul-2015 08:17:10

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




Date: 27-Jul-2015 08:18:00

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

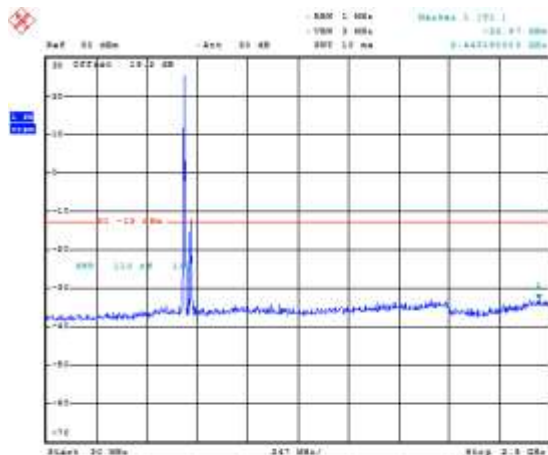


Date: 27-Jul-2015 08:18:44

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

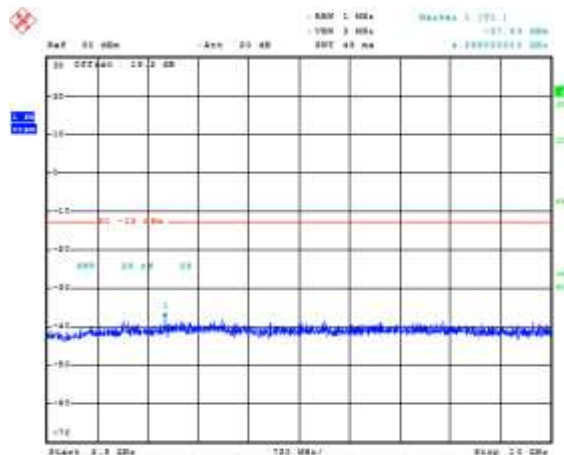
LTE Band 17 Conducted RF Emission Test Data cont'd

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



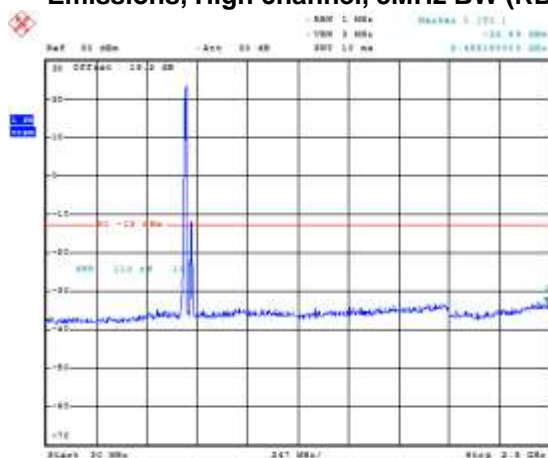
Date: 27-Jul-2015 08:19:49

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



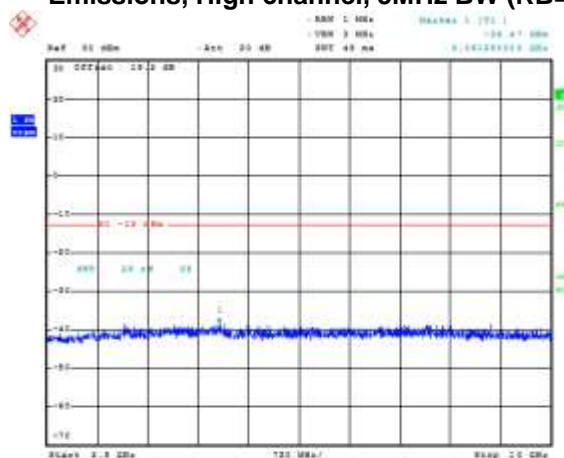
Date: 27-Jul-2015 08:20:02

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




Date: 27-Jul-2015 08:21:04

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

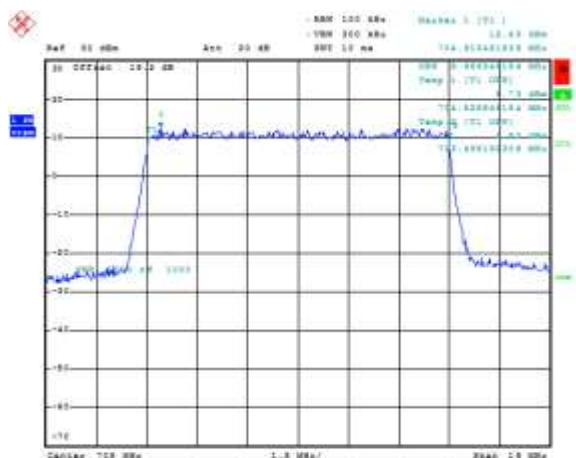


Date: 27-Jul-2015 08:21:20

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

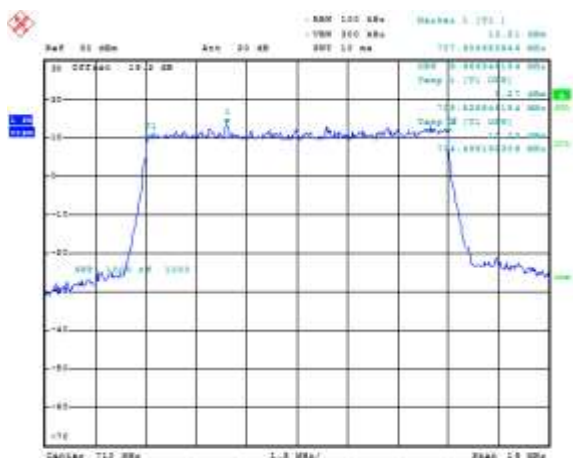
LTE Band 17 Conducted RF Emission Test Data cont'd

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



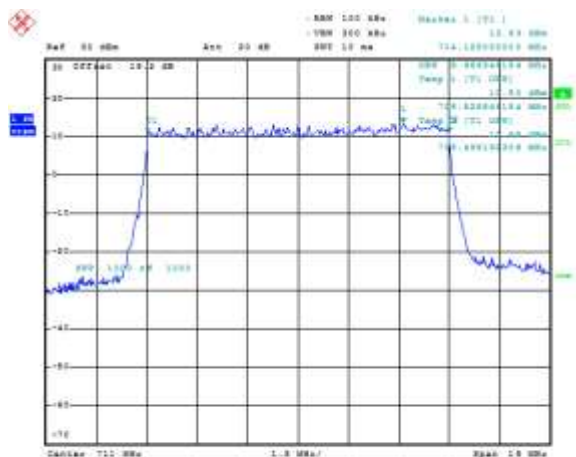
Date: 27-JUL-2015 18:02:14

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




Date: 27-JUL-2015 18:09:04

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

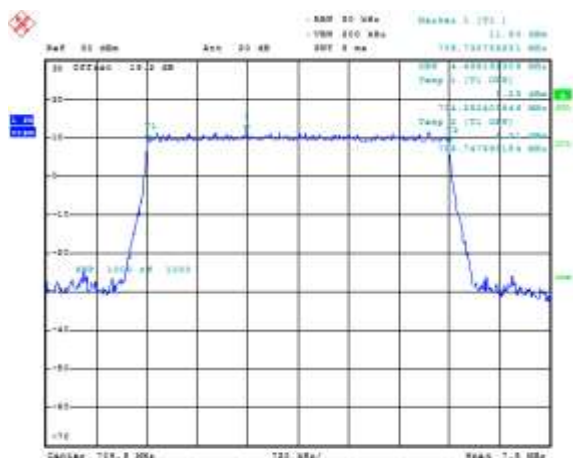


Date: 27-JUL-2015 18:09:41

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

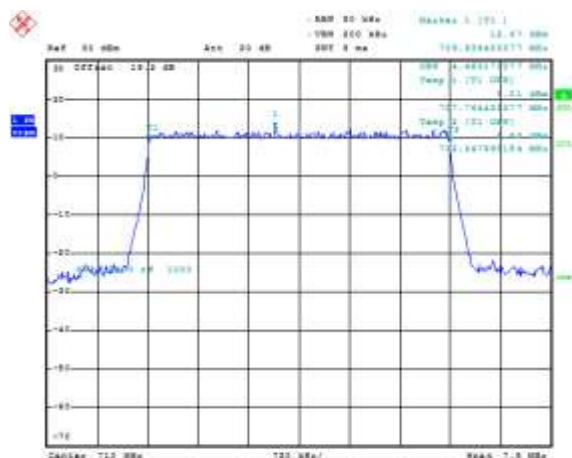
LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-16a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=50



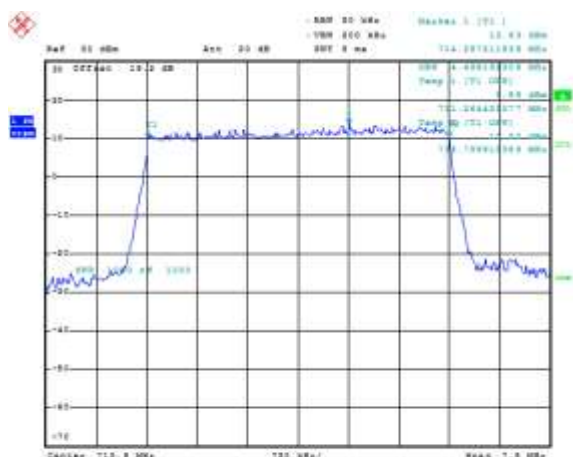
Date: 27-JUL-2015 18:06:52

Figure 6-17a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=50




Date: 27-JUL-2015 18:07:21

Figure 6-18a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=50

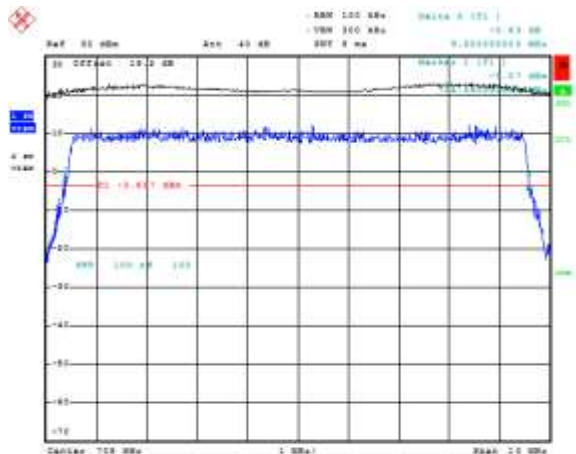


Date: 27-JUL-2015 18:07:48

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

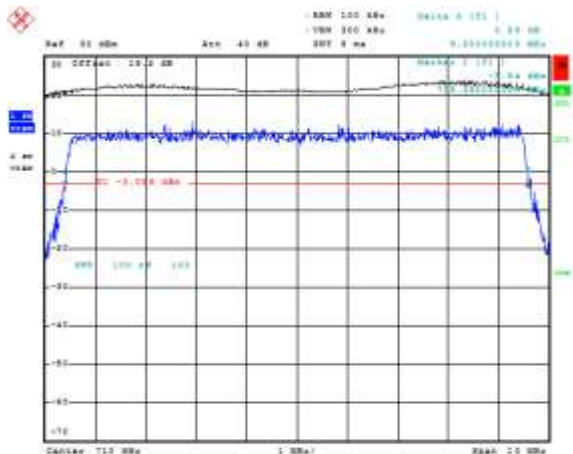
LTE Band 17 Conducted RF Emission Test Data cont'd

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



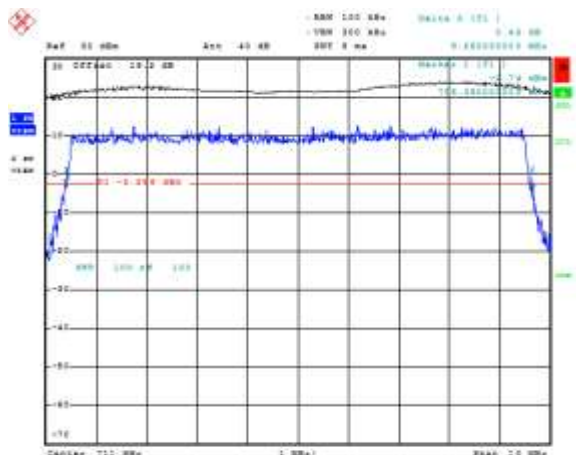
Date: 27.JUL.2015 18:18:57

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



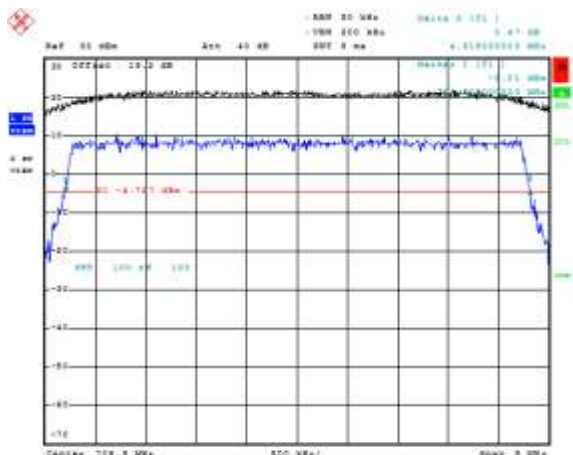
Date: 27.JUL.2015 18:19:11

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




Date: 27.JUL.2015 18:19:26

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

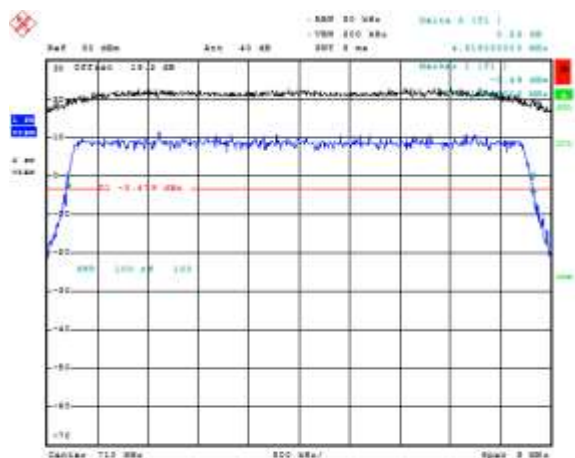


Date: 27.JUL.2015 18:19:49

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

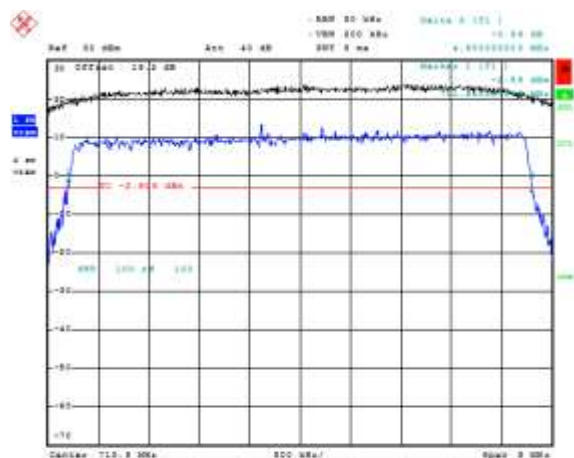
LTE Band 17 Conducted RF Emission Test Data cont'd

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



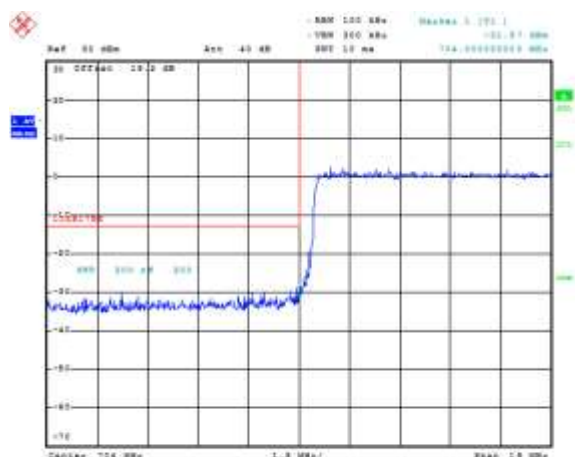
Date: 27.JUL.2015 18:50:58

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



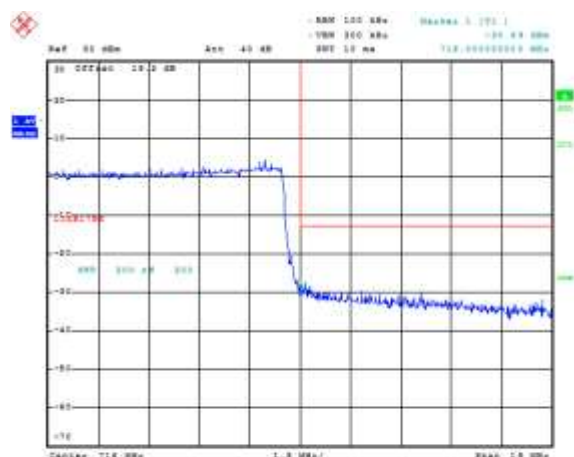
Date: 27.JUL.2015 18:50:58

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




Date: 26.JUL.2015 05:12:56

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



Date: 26.JUL.2015 05:10:31

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 Conducted RF Emission Test Data cont'd

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

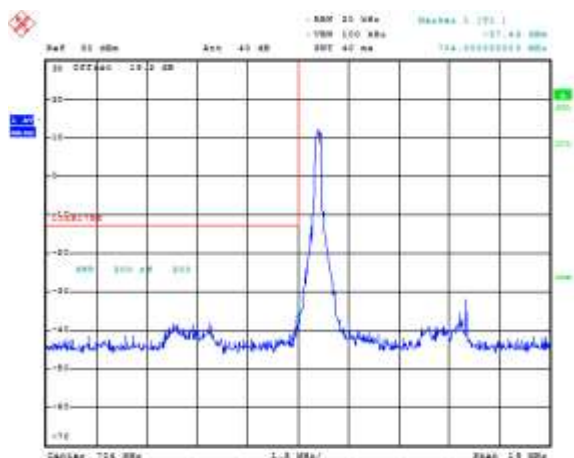


Figure 6-28a: Band 17 High Channel Mask, 10MHz BW, RB=1

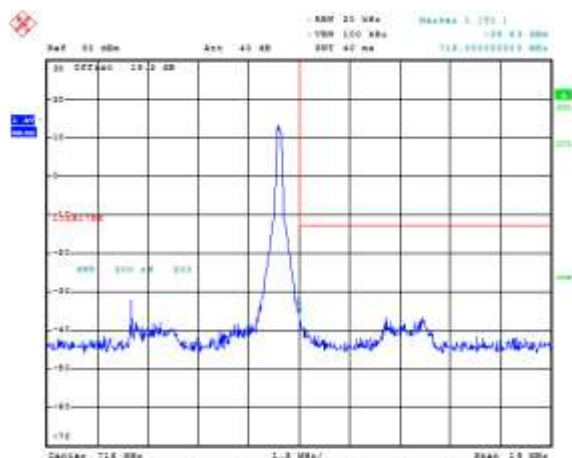


Figure 6-29a: Band 17 Low Channel Mask, 5MHz BW, RB=25

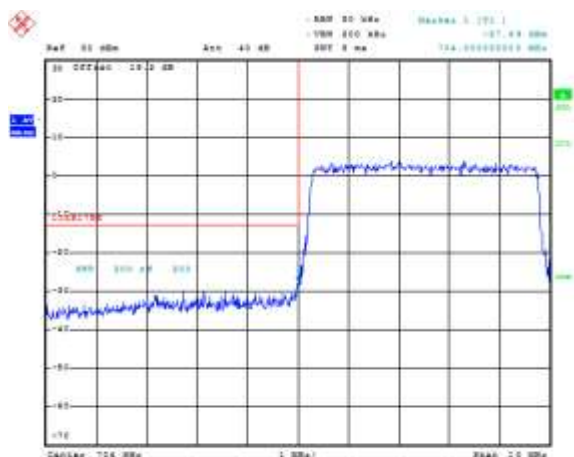
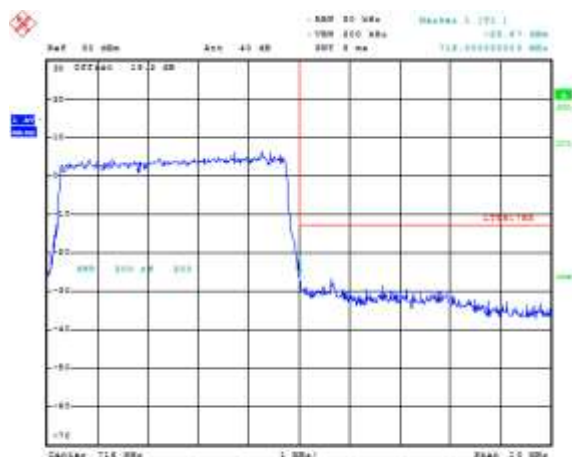



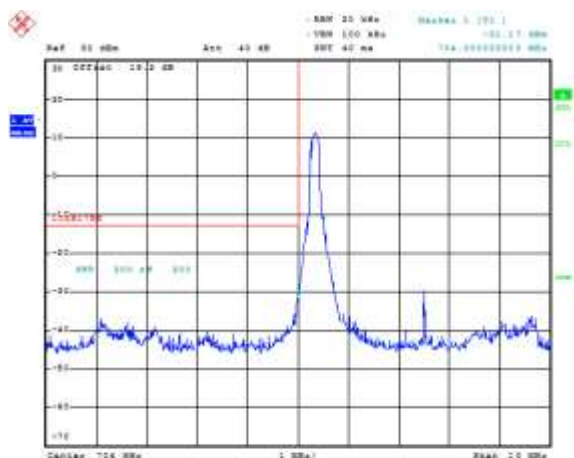
Figure 6-30a: Band 17 High Channel Mask, 5MHz BW, RB=25



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

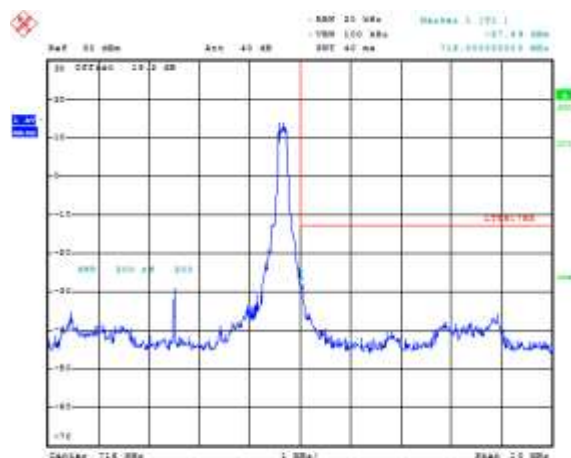
LTE Band 17 Conducted RF Emission Test Data cont'd

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



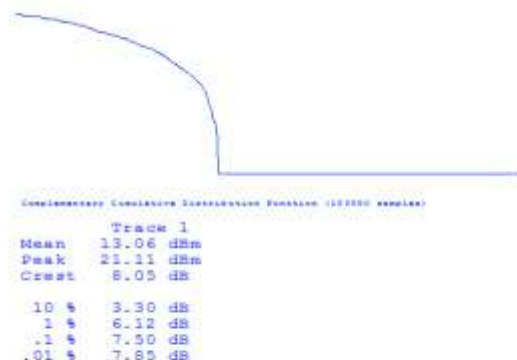
Date: 29-JUL-2015 05:12:50

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



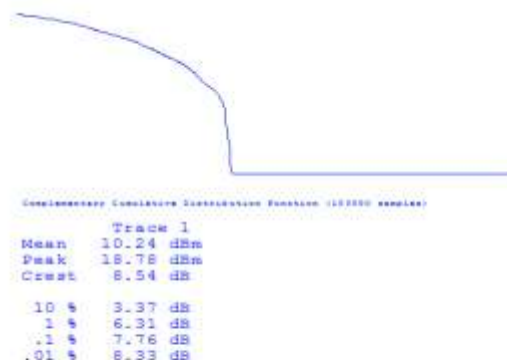
Date: 29-JUL-2015 05:14:29

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




Date: 8-SEP-2015 04:46:25

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

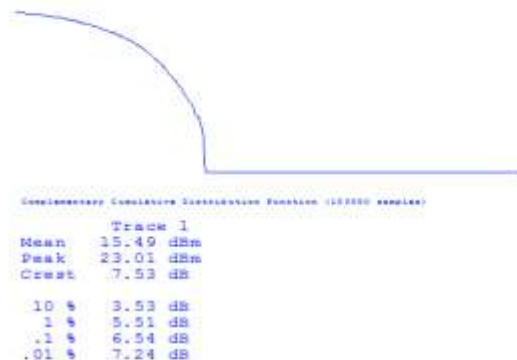


Date: 8-SEP-2015 04:46:34

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

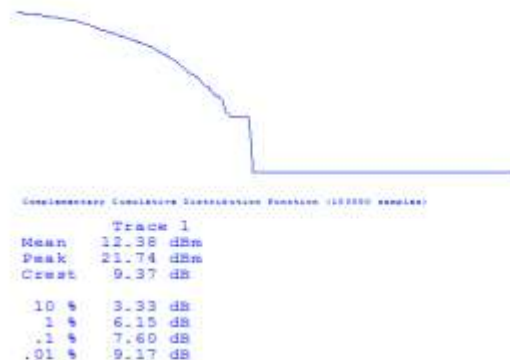
LTE Band 17 Conducted RF Emission Test Data cont'd

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



Date: 8-SEP-2015 09:46:58

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

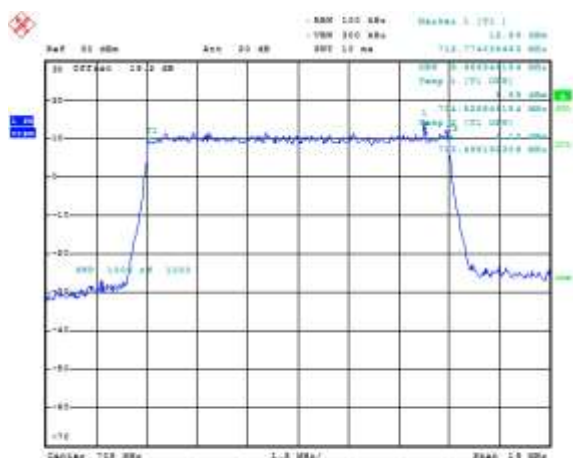


Date: 8-SEP-2015 09:47:56

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

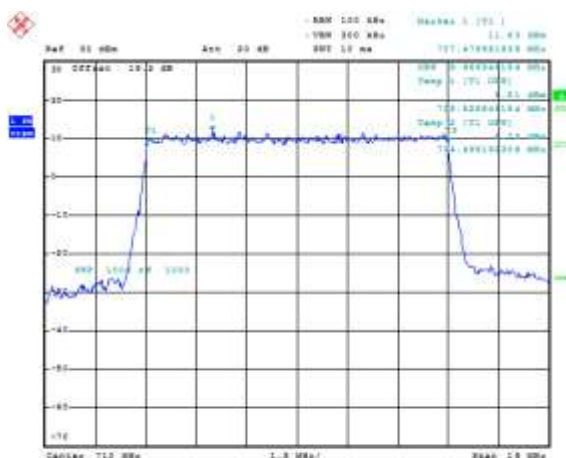
LTE Band 17 Conducted RF Emission Test Data cont'd

Figure 6-37a: Occupied Bandwidth, Band 17 Low Channel, 10MHz BW (RB= 50) 16-QAM



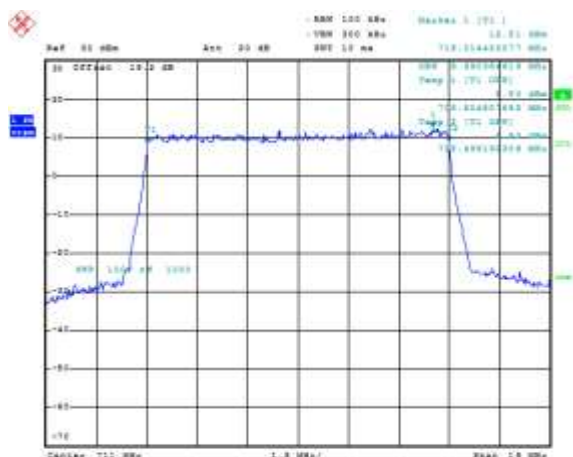
Date: 27.JUL.2015 18:06:28

Figure 6-38a: Occupied Bandwidth, Band 17 Mid Channel, 10MHz BW (RB= 50) 16-QAM



Date: 27.JUL.2015 18:06:28

Figure 6-39a: Occupied Bandwidth, Band 17 High Channel, 10MHz BW (RB= 50) 16-QAM

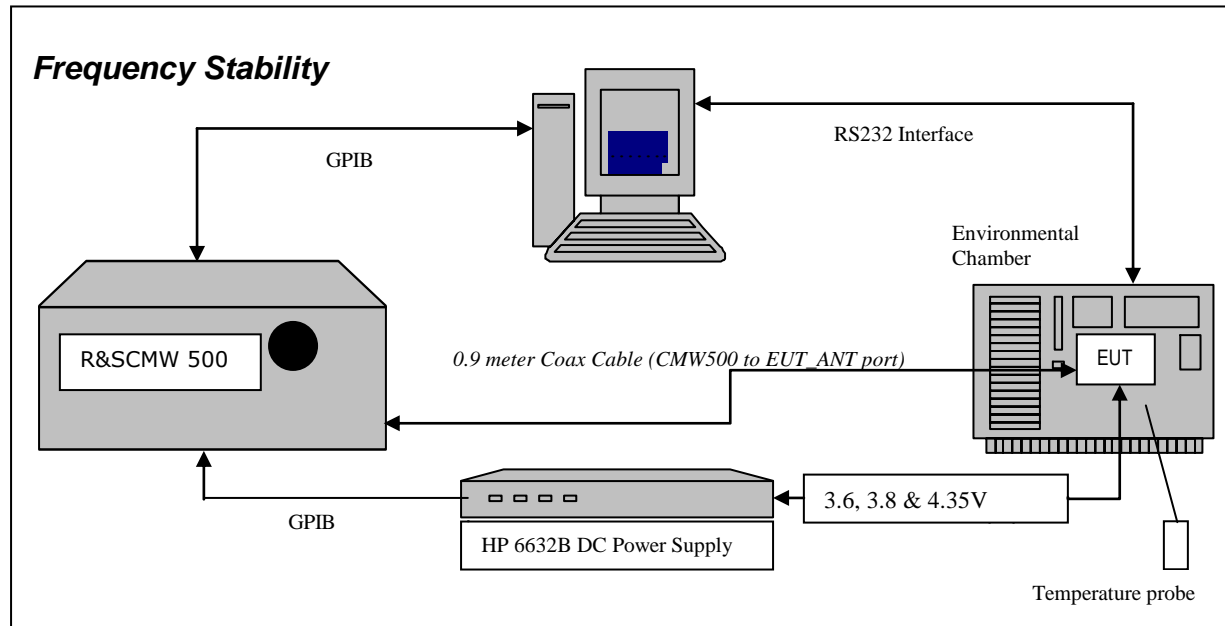


Date: 27.JUL.2015 18:06:28

APPENDIX 7B – LTE Band 17 FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 Frequency Stability Test Data



The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Sijia Li.

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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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 3.8 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 709.0 MHz, 710.0 MHz and 711.0 MHz each was measured under 10 MHz bandwidth with maximum (50) RBs. 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


Procedure:

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

57. Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
58. Start test program
59. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
60. Set power supply voltage to 3.6 volts.
61. Set up CMW 500 Radio Communication Tester.
62. Command the CMW 500 to switch to the low channel.
63. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
64. EUT is commanded to Transmit 100 Bursts.
65. 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.
66. The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
67. Repeat steps 5 to 10 changing the supply voltage to 3.8 Volts
68. Increase temperature by 10°C and soak for 1/2 hour.
69. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
70. Repeat steps 5 to 10 changing the supply voltage to 4.35 volts

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

The maximum frequency error in the LTE band 17 measured was **-0.0045 PPM**.


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 results: channels 23780, 23790 and 23800 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.6	20	2.33	0.0033
23790	710.0	3.6	20	-1.90	-0.0027
23800	711.0	3.6	20	-3.18	-0.0045


Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.8	20	1.80	0.0025
23790	710.0	3.8	20	2.70	0.0038
23800	711.0	3.8	20	-2.93	-0.0041

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	20	2.09	0.0029
23790	710.0	4.35	20	2.43	0.0034
23800	711.0	4.35	20	-2.23	-0.0031

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


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	-2.33	-0.0033
23780	709.0	3.6	-20	2.72	0.0038
23780	709.0	3.6	-10	-2.53	-0.0036
23780	709.0	3.6	0	3.20	0.0045
23780	709.0	3.6	10	-1.44	-0.0020
23780	709.0	3.6	20	2.33	0.0033
23780	709.0	3.6	30	-2.62	-0.0037
23780	709.0	3.6	40	-2.82	-0.0040
23780	709.0	3.6	50	-2.88	-0.0041
23780	709.0	3.6	60	-2.06	-0.0029
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	3.8	-30	-2.25	-0.0032
23780	709.0	3.8	-20	-2.70	-0.0038
23780	709.0	3.8	-10	2.43	0.0034
23780	709.0	3.8	0	3.25	0.0046
23780	709.0	3.8	10	1.65	0.0023
23780	709.0	3.8	20	1.80	0.0025
23780	709.0	3.8	30	-3.33	-0.0047
23780	709.0	3.8	40	-2.07	-0.0029
23780	709.0	3.8	50	-3.10	-0.0044
23780	709.0	3.8	60	-2.98	-0.0042
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23780	709.0	4.35	-30	3.18	0.0045
23780	709.0	4.35	-20	-2.06	-0.0029
23780	709.0	4.35	-10	-1.90	-0.0027
23780	709.0	4.35	0	3.76	0.0053
23780	709.0	4.35	10	2.66	0.0038
23780	709.0	4.35	20	2.09	0.0029
23780	709.0	4.35	30	-3.76	-0.0053
23780	709.0	4.35	40	2.55	0.0036
23780	709.0	4.35	50	-2.62	-0.0037
23780	709.0	4.35	60	2.17	0.0031

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


LTE band 5 Results: channel 23790 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	3.6	-30	-2.70	-0.0038
23790	710.0	3.6	-20	-1.90	-0.0027
23790	710.0	3.6	-10	-2.29	-0.0032
23790	710.0	3.6	0	3.56	0.0050
23790	710.0	3.6	10	2.56	0.0036
23790	710.0	3.6	20	-1.90	-0.0027
23790	710.0	3.6	30	1.24	0.0018
23790	710.0	3.6	40	-2.85	-0.0040
23790	710.0	3.6	50	1.63	0.0023
23790	710.0	3.6	60	2.57	0.0036
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	3.8	-30	-1.50	-0.0021
23790	710.0	3.8	-20	3.45	0.0049
23790	710.0	3.8	-10	1.93	0.0027
23790	710.0	3.8	0	2.89	0.0041
23790	710.0	3.8	10	-2.15	-0.0030
23790	710.0	3.8	20	2.70	0.0038
23790	710.0	3.8	30	-2.63	-0.0037
23790	710.0	3.8	40	2.27	0.0032
23790	710.0	3.8	50	-2.60	-0.0037
23790	710.0	3.8	60	-2.99	-0.0042
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23790	710.0	4.35	-30	-2.33	-0.0033
23790	710.0	4.35	-20	-1.86	-0.0026
23790	710.0	4.35	-10	2.19	0.0031
23790	710.0	4.35	0	-2.53	-0.0036
23790	710.0	4.35	10	1.60	0.0023
23790	710.0	4.35	20	2.43	0.0034
23790	710.0	4.35	30	-2.47	-0.0035
23790	710.0	4.35	40	-2.03	-0.0029
23790	710.0	4.35	50	-2.96	-0.0042
23790	710.0	4.35	60	1.36	0.0019

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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	-4.49	-0.0063
23800	711.0	3.6	-20	-4.41	-0.0062
23800	711.0	3.6	-10	2.03	0.0029
23800	711.0	3.6	0	-2.98	-0.0042
23800	711.0	3.6	10	-3.16	-0.0044
23800	711.0	3.6	20	-3.18	-0.0045
23800	711.0	3.6	30	-5.49	-0.0077
23800	711.0	3.6	40	-1.49	-0.0021
23800	711.0	3.6	50	-4.88	-0.0069
23800	711.0	3.6	60	-3.03	-0.0043
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	3.8	-30	-3.93	-0.0055
23800	711.0	3.8	-20	-3.38	-0.0047
23800	711.0	3.8	-10	2.05	0.0029
23800	711.0	3.8	0	-3.12	-0.0044
23800	711.0	3.8	10	-1.97	-0.0028
23800	711.0	3.8	20	-2.93	-0.0041
23800	711.0	3.8	30	-2.99	-0.0042
23800	711.0	3.8	40	-4.06	-0.0057
23800	711.0	3.8	50	-3.65	-0.0051
23800	711.0	3.8	60	-3.79	-0.0053
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23800	711.0	4.35	-30	-2.76	-0.0039
23800	711.0	4.35	-20	-3.63	-0.0051
23800	711.0	4.35	-10	-2.12	-0.0030
23800	711.0	4.35	0	-2.92	-0.0041
23800	711.0	4.35	10	-1.93	-0.0027
23800	711.0	4.35	20	-2.23	-0.0031
23800	711.0	4.35	30	-3.02	-0.0042
23800	711.0	4.35	40	-3.22	-0.0045
23800	711.0	4.35	50	-5.19	-0.0073
23800	711.0	4.35	60	2.10	0.0030


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Procedure for IC:

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. Using a resolution bandwidth equal to that permitted within the 1MHz band immediately outside the channel edge, reference points will be selected at the unwanted emission levels which comply with the attenuation $43 + 10 \log_{10} p$, for the type of device under test, on the emission mask of the lowest and highest channels, and the frequency at these points shall be recorded as fL and fH respectively.
11. The frequency stability is calculated by fL minus the frequency offset (frequency error measured in step 9) and fH plus the frequency offset shall be within the frequency range that the equipment is designed to operate (2.5 to 2.57 GHz).
12. The CMW 500 commands the EUT to change frequency to the high channel and repeats steps 7 to 11.
13. Repeat steps 5 to 12 changing the supply voltage to 3.8 Volts
14. Increase temperature to 20 and 50°C and soak for 1/2 hour.
15. Repeat steps 4 - 14 for temperatures -30°C to 60°C .
16. Repeat steps 5 to 15 changing the supply voltage to 4.35 volts

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

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Date of test: September 2, 2015.


IC RSS – 130, 4.3 LTE Band 17 Frequency Stability.

LTE Band 17 10MHz Bandwidth results: channels 23780, & 23800 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Band 17 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH-Freq Offset (MHz)
23780	709.0	3.6	20	-1.90258	704.405	N/A	704.405	N/A
23800	711.0	3.6	20	-2.446175	N/A	715.565	N/A	715.565

Traffic Channel Number	LTE Band 17 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH-Freq Offset (MHz)
23780	709.0	3.8	20	3.733635	704.42	N/A	704.42	N/A
23800	711.0	3.8	20	-1.945496	N/A	715.58	N/A	715.58

Traffic Channel Number	LTE Band 17 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH-Freq Offset (MHz)
23780	709.0	4.35	20	-2.717972	704.405	N/A	704.405	N/A
23800	711.0	4.35	20	-1.373291	N/A	715.565	N/A	715.565

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 17 10MHz Bandwidth results: channels 23780, & 23800 @ -30 and +60°C maximum transmitted power

Traffic Channel Number	LTE Band 17 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	fL (MHz)	fH (MHz)	fL-Freq Offset (MHz)	fH-Freq Offset (MHz)
23780	709.0	3.6	-30	-3.347397	704.42	N/A	704.42	N/A
23800	711.0	3.6	-30	-4.320145	N/A	715.565	N/A	715.565
23780	709.0	3.8	-30	-3.318787	704.42	N/A	704.42	N/A
23800	711.0	3.8	-30	-3.962517	N/A	715.565	N/A	715.565
23780	709.0	4.35	-30	-2.474785	704.435	N/A	704.435	N/A
23800	711.0	4.35	-30	-4.205704	N/A	715.565	N/A	715.565
23780	709.0	3.6	60	-2.989769	704.405	N/A	704.405	N/A
23800	711.0	3.6	60	-3.232956	N/A	715.565	N/A	715.565
23780	709.0	3.8	60	-1.730919	704.435	N/A	704.435	N/A
23800	711.0	3.8	60	-3.876686	N/A	715.58	N/A	715.58
23780	709.0	4.35	60	-2.717972	704.435	N/A	704.435	N/A
23800	711.0	4.35	60	-4.177094	N/A	715.565	N/A	715.565

APPENDIX 7C – LTE Band 17 RADIATED EMISSIONS TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 7C		
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW	

Radiated Power Test Data Results

The following configurations were measured for model RHK211LW (STV100-1):

Date of Test: August 7, 2015

The following measurements were performed by Shiva Kumbham.

The environmental tests conditions were: Temperature: 27.0 °C

Relative Humidity: 37 %

The BlackBerry® smartphone was standalone, vertically with 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 17, 5MHz BW, RB=1, QPSK modulation


EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	23780	709.00	17	Dipole	V	-45.77	-30.93	V-V	2.26	20.55	0.11	35.00	14.45
F0	23780	709.00	17	Dipole	H	-30.93		H-H	-1.53				
F0	23790	710.00	17	Dipole	V	-46.00	-30.96	V-V	2.38	20.70	0.12	35.00	14.30
F0	23790	710.00	17	Dipole	H	-30.96		H-H	-1.51				
F0	23799	710.90	17	Dipole	V	-46.30	-31.13	V-V	2.30	20.56	0.11	35.00	14.44
F0	23799	710.90	17	Dipole	H	-31.13		H-H	-1.68				

LTE band 17, 5MHz BW, RB=1, 16-QAM modulation

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Limit (dBm)	Diff. To Limit (dB)
		(MHz)								(dBm)	(dBm)		
F0	23780	709.00	17	Dipole	V	-46.68	-31.67	V-V	1.51	19.80	0.10	35.00	15.20
F0	23780	709.00	17	Dipole	H	-31.67		H-H	-2.26				
F0	23790	710.00	17	Dipole	V	-46.99	-32.10	V-V	1.26	19.58	0.09	35.00	15.42
F0	23790	710.00	17	Dipole	H	-32.10		H-H	-2.61				
F0	23799	710.90	17	Dipole	V	-47.02	-31.97	V-V	1.49	19.75	0.09	35.00	15.25
F0	23799	710.90	17	Dipole	H	-31.97		H-H	-2.50				

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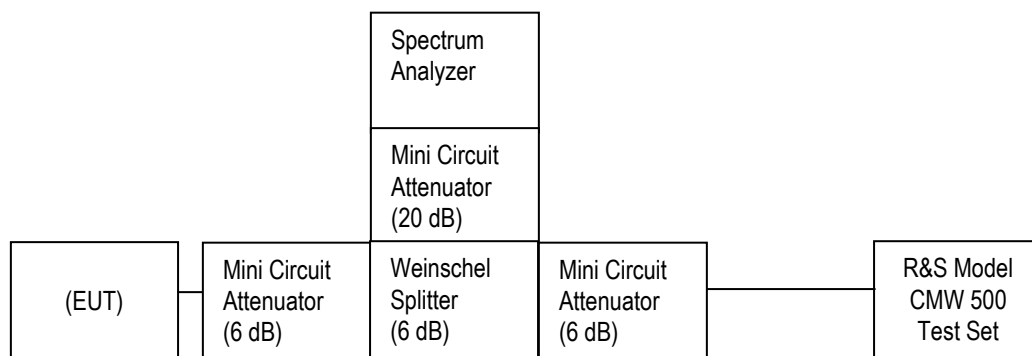
APPENDIX 8A– LTE Band 30 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 30 Conducted RF Emission Test Data

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

Test Setup Diagram




The following configurations were measured for model RHK211LW (STV100-1):

Date of Test: July 27 – September 21, 2015

The environmental test conditions were: Temperature: 22.7 – 23.6 °C
 Relative Humidity: 38.7 – 61.2 %

The following measurements were performed by Kevin Guo and Landon Martin.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 30 Conducted RF Emission Test Data cont'd

Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)	Emission Designator	Band	Bandwidth (MHz)	Modulation
2307.5-2312.5	24.57	0.29	4M48G7D	LTE B30	5	QPSK
2307.5-2312.5	23.54	0.23	4M48D7W	LTE B30	5	16QAM
2310-2310	24.56	0.29	8M94G7D	LTE B30	10	QPSK
2310-2310	24.36	0.27	8M94D7W	LTE B30	10	16QAM

The conducted spurious emissions – As per 47 CFR 2.1051, 27.53(a)(4), RSS-195, 5.6 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 RBs for LTE Band 30.


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

A minimum RB 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 30 was measured to be 9.15 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Test Data for LTE Band 30 selected Frequencies in 10MHz BW (RB = 50)

LTE Band 30 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2310	9.15	8.94

Test Data for LTE Band 30 selected Frequencies in 5MHz BW (RB = 25)


LTE Band 30 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2307.5	4.625	4.48
2310	4.63	4.47
2312.5	4.66	4.48

Test Data for LTE Band 30 selected Frequencies in 10MHz BW (RB = 25)

LTE Band 30 Frequency (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	16-QAM
2310	8.94	8.92

Test Data for LTE Band 30 selected Frequencies in 5MHz BW (RB = 25)

LTE Band 17 Frequency (MHz)	99% Occupied Bandwidth (MHz)	
	QPSK	16-QAM
2307.5	4.48	4.48
2310	4.47	4.48
2312.5	4.48	4.47

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Peak to Average Ratio (PAR)

For each 5MHz and 10MHz with Resource Block allocation 50,25 and 15 as per scalable bandwidths for LTE Band 30, 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 9.61 dB on 10MHz bandwidth with Resource Block allocation 25 while transmitting at 707.5MHz.


Measurement Plots for LTE Band 30

See Figures 8-1a to 8-8a for the plots of the conducted spurious emissions.

See Figures 8-9a to 8-16a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

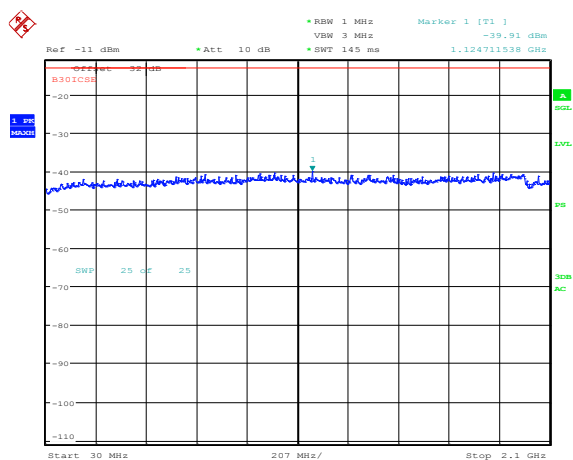
See Figures 8-17a to 8-21a for the plots of the Channel mask.

See Figures 8-22a for the plots of the Peak to Average Ratio.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

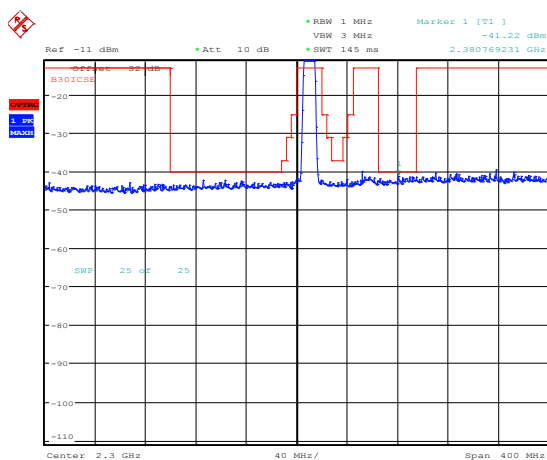
LTE Band 30 Conducted RF Emission Test Data cont'd

Figure 8-1a: Band 30, Spurious Conducted Emissions, 10MHz BW (RB= 50)



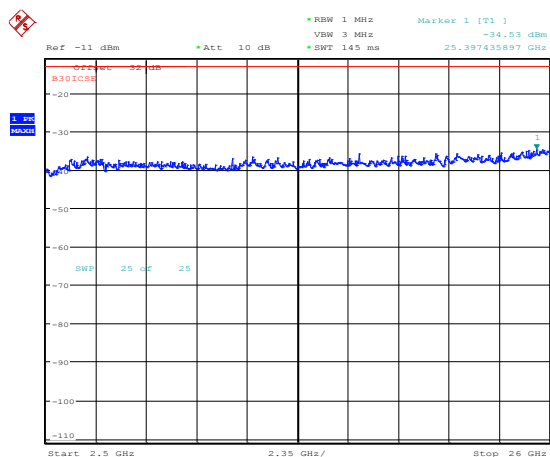
Date: 21.SEP.2015 22:03:03

Figure 8-2a: Band 30, Spurious Conducted Emissions, 10MHz BW (RB= 50)



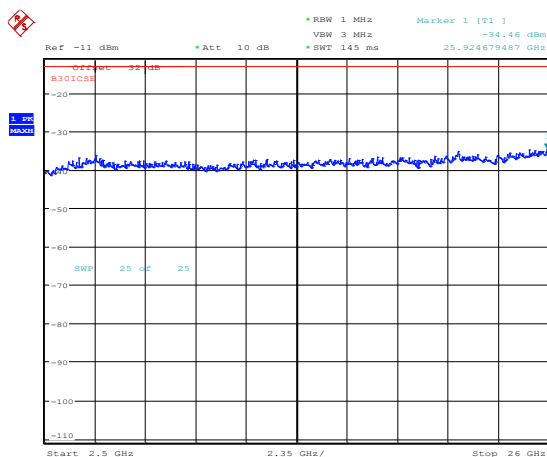
Date: 21.SEP.2015 21:56:52

Figure 8-3a: Band 30, Spurious Conducted Emissions, 10MHz BW (RB= 50)




Date: 21.SEP.2015 22:04:08

Figure 8-4a: Band 30, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)

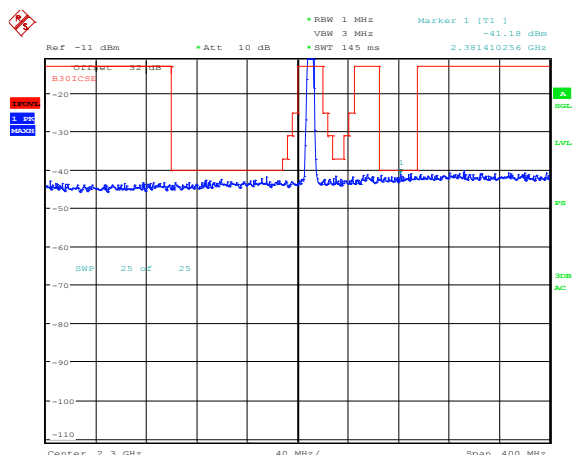


Date: 21.SEP.2015 22:05:08

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

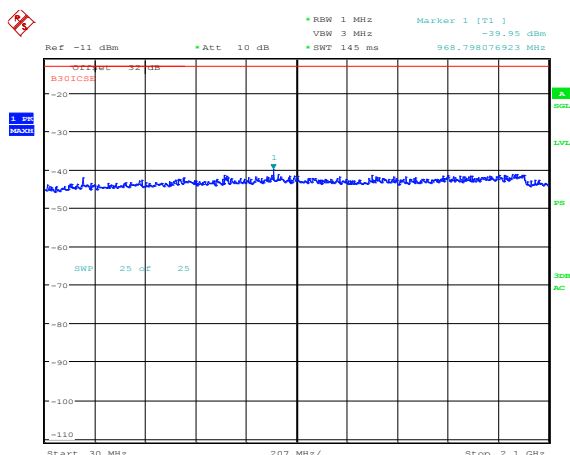
LTE Band 30 Conducted RF Emission Test Data cont'd

Figure 8-5a: Band 30, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)



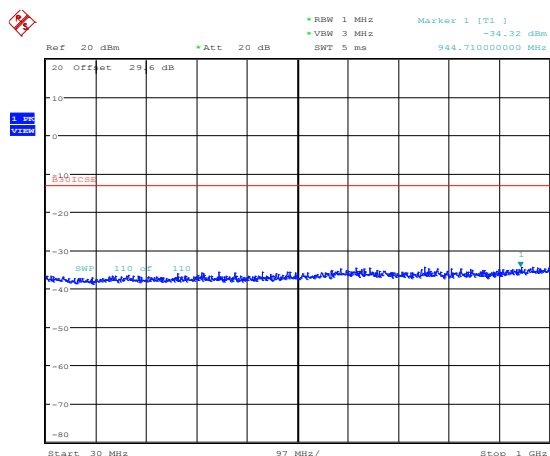
Date: 21.SEP.2015 21:59:24

Figure 8-6a: Band 30, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)



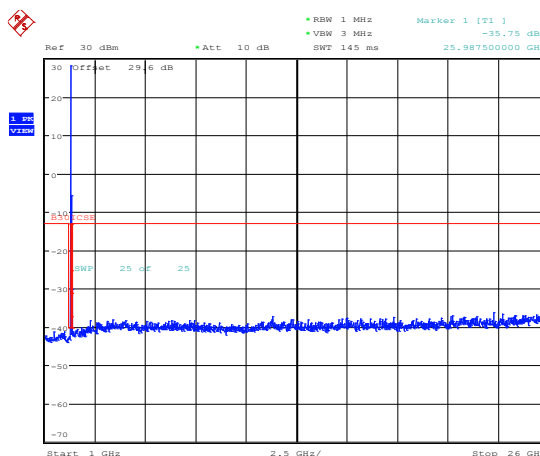
Date: 21.SEP.2015 22:06:27

Figure 8-7a: Band 30, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)




Date: 21.SEP.2015 19:41:26

Figure 8-8a: Band 30, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)

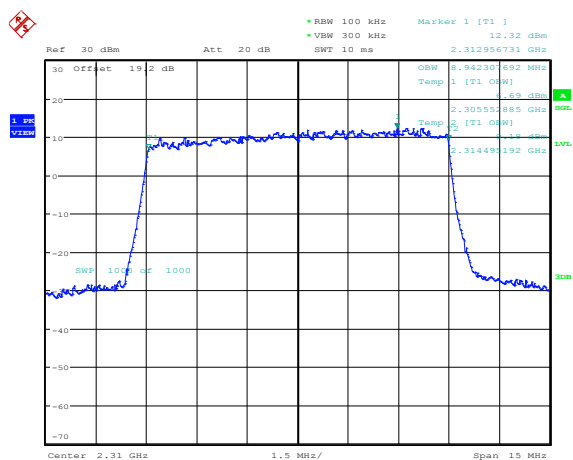


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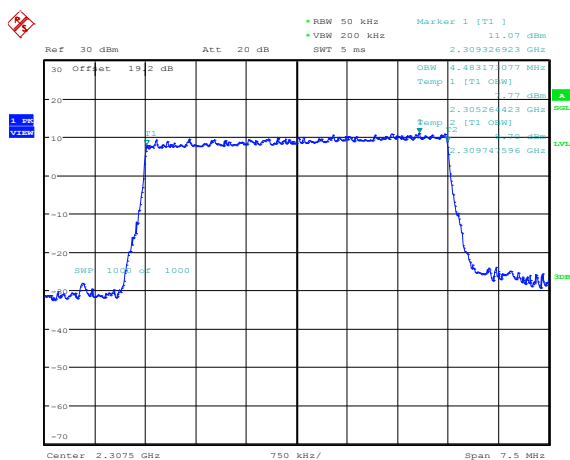
	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 30 Conducted RF Emission Test Data cont'd

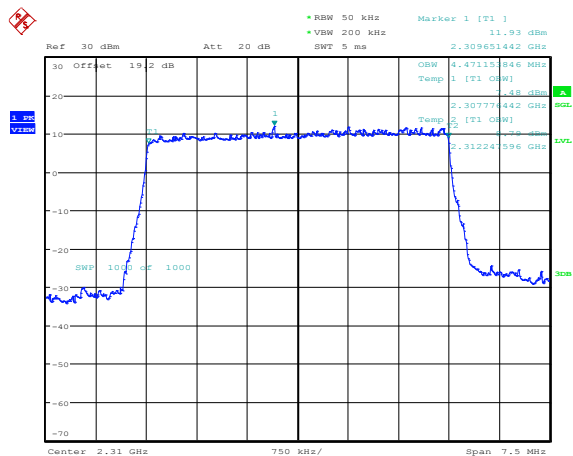
**Figure 8-9a: Occupied Bandwidth, Band 30
10MHz BW, RB=50**



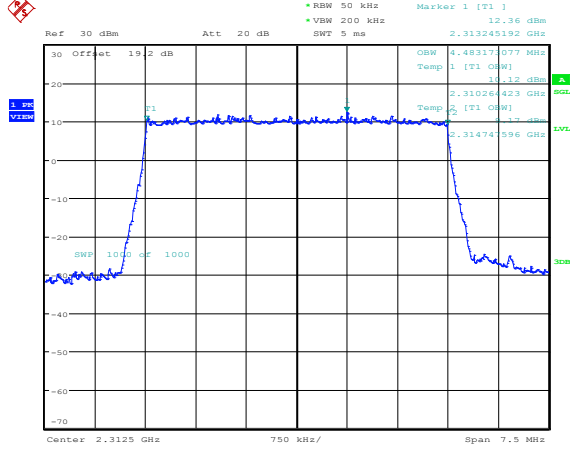
**Figure 8-10a: Occupied Bandwidth, Band 5 Low
Channel, 5MHz BW, RB=25**




**Figure 8-11a: Occupied Bandwidth, Band 5 Middle
Channel, 5MHz BW, RB=25**



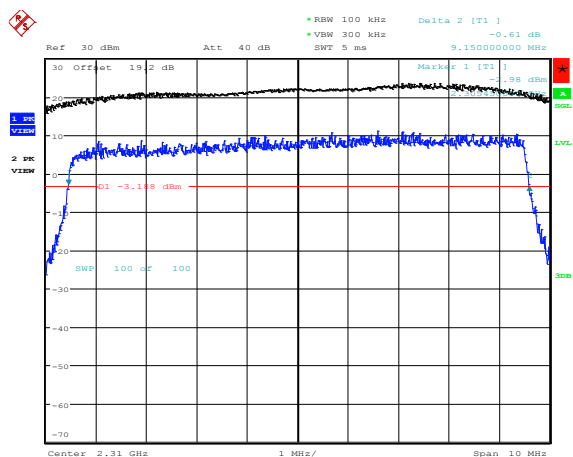
**Figure 8-12a: Occupied Bandwidth, Band 5 High
Channel, 5MHz BW, RB=25**



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

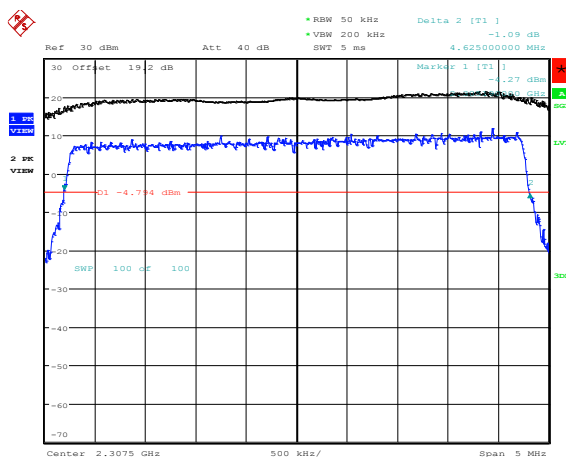
LTE Band 30 Conducted RF Emission Test Data cont'd

Figure 8-13a: -26 dBc Bandwidth, Band 30 Middle Channel, 10MHz BW, RB=50



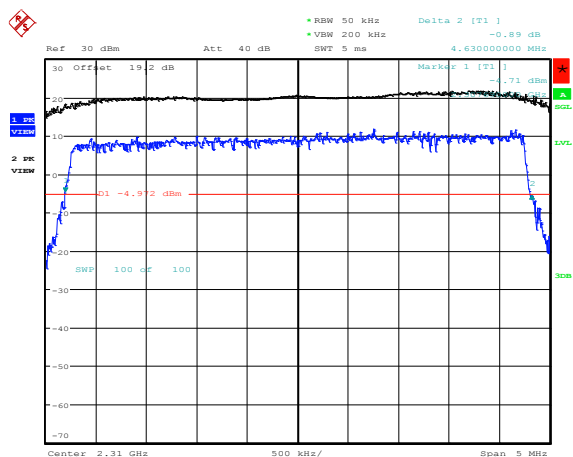
Date: 28.JUL.2015 09:39:06

Figure 8-14a: -26 dBc Bandwidth, Band 30 Low Channel, 5MHz BW, RB=25



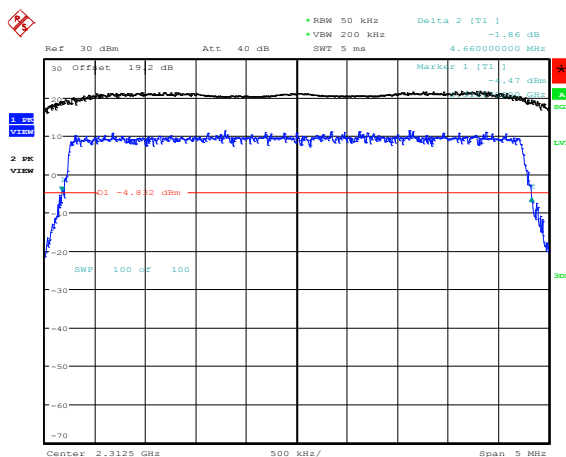
Date: 28.JUL.2015 09:39:46

Figure 8-15a: -26 dBc Bandwidth, Band 30 Middle Channel, 5MHz BW, RB=25




Date: 28.JUL.2015 09:40:01

Figure 8-16a: -26 dBc Bandwidth, Band 30 High Channel, 5MHz BW, RB=25

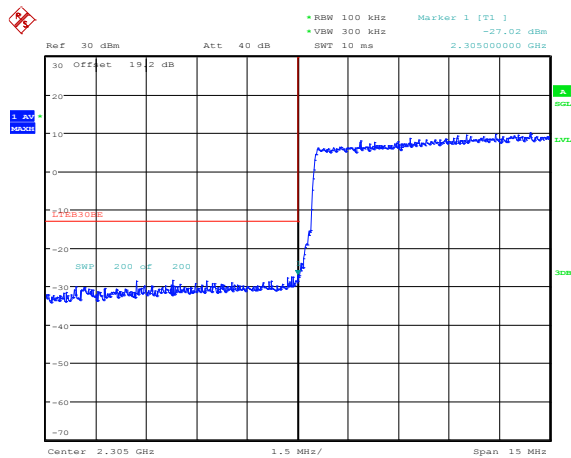


Date: 28.JUL.2015 09:40:16

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

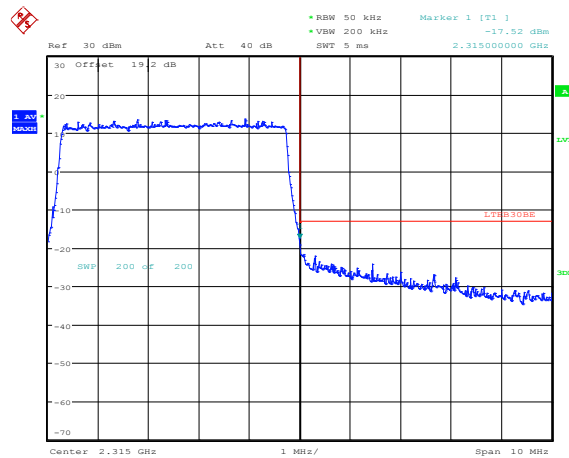
LTE Band 30 Conducted RF Emission Test Data cont'd

Figure 8-17a: Band 30 Channel Mask, 10MHz BW, RB=50



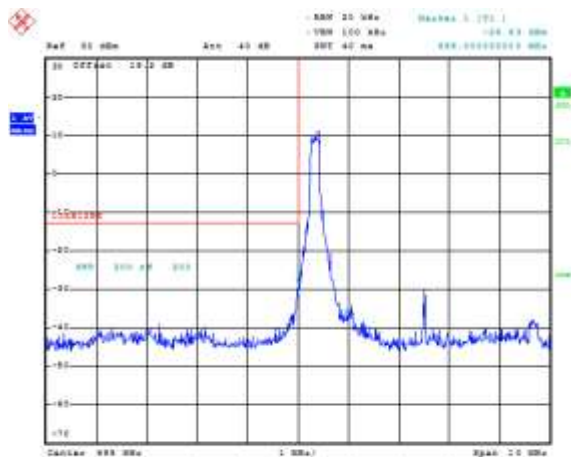
Date: 29.JUL.2015 20:50:14

Figure 8-17a: Band 30 Channel Mask, 10MHz BW, RB=50



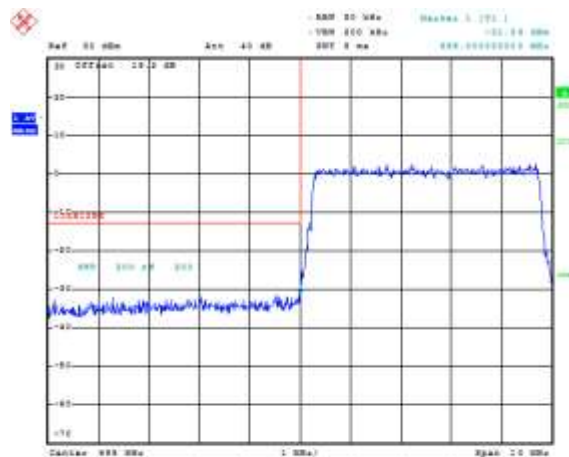
Date: 29.JUL.2015 20:55:35

Figure 8-18a: Band 30 Low Channel Mask, 5MHz BW, RB=1




Date: 29.JUL.2015 22:50:58

Figure 8-19a: Band 30 Low Channel Mask, 5MHz BW, RB=25



Date: 29.JUL.2015 22:51:07

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 30 Conducted RF Emission Test Data cont'd

Figure 8-20a: Band 30 High Channel Mask, 5MHz BW, RB=1

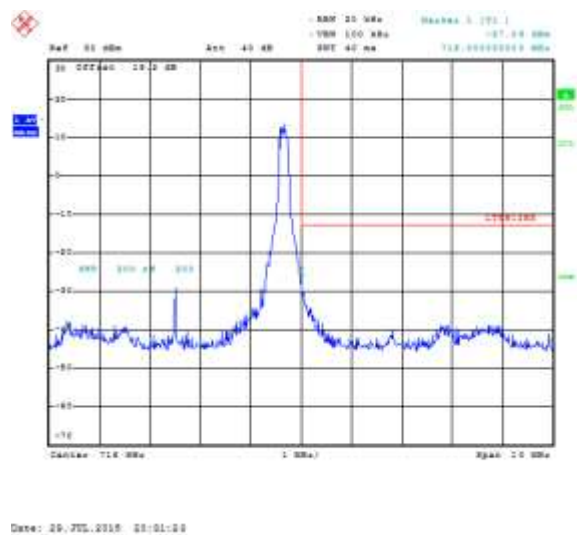


Figure 8-21a: Band 30 High Channel Mask, 5MHz BW, RB=25

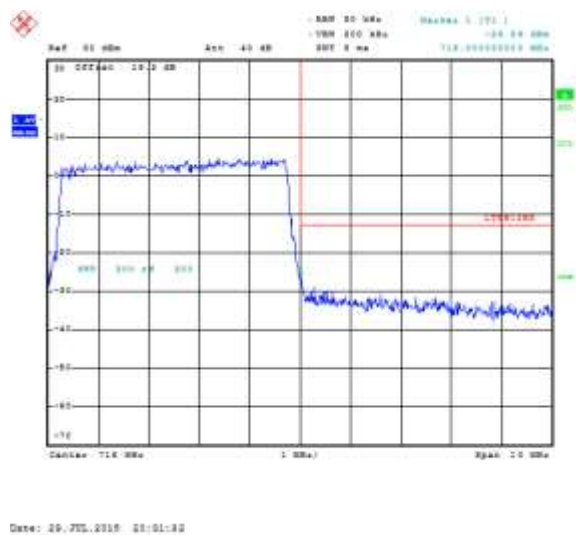
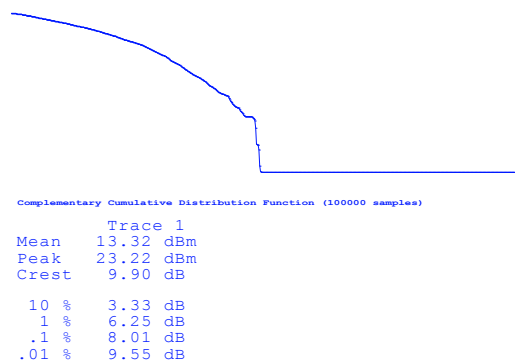


Figure 8-22a: Band 30 PAR, 10MHz BW, RB=25

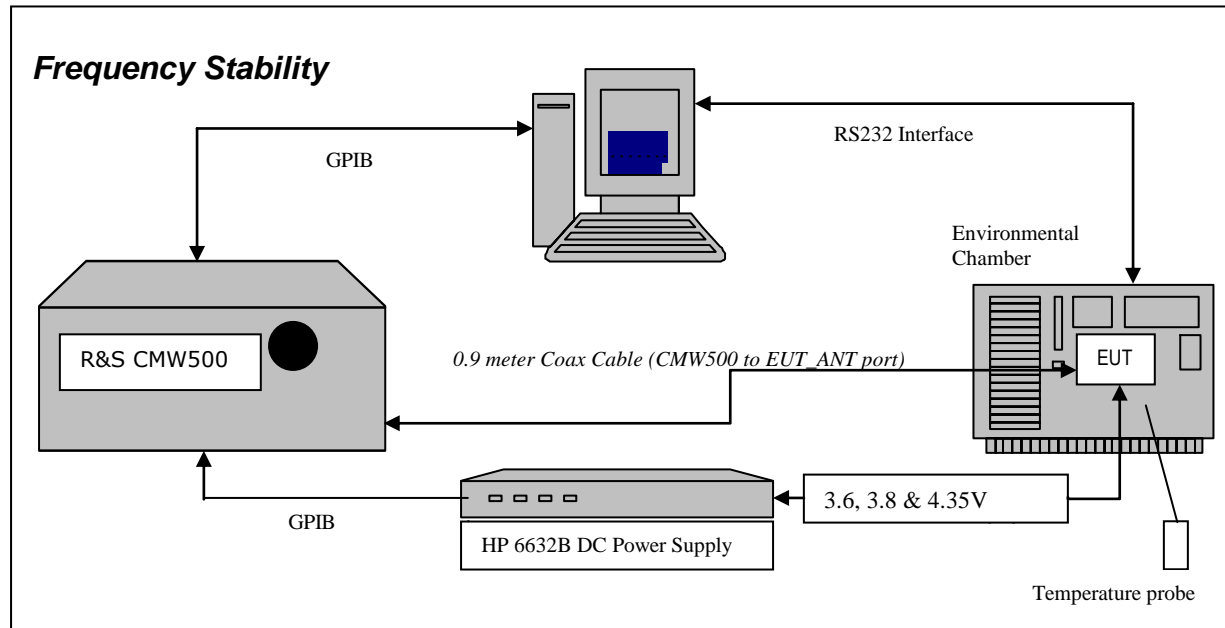


Date: 3-SEP-2015 03:17:20

APPENDIX 8B – LTE Band 30 FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 30 Frequency Stability Test Data



The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Sijia Li.

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, 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

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, 3.8 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 volts and 4.35 volts. The transmit frequency was measured on 782MHz for 10MHz bandwidth with maximum (50) RB. The transmit frequency was varied in 3 steps consisting of 779.5 MHz, 782.0 MHz and 784.5 MHz each was measured under 5 MHz bandwidth with maximum (25) RBs. 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


Procedure:

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

71. Switch on the HP 6632B power supply; CMW 500 Communications test Set, and Environmental Chamber.
72. Start test program
73. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
74. Set power supply voltage to 3.6 volts.
75. Set up CMW 500 Radio Communication Tester.
76. Command the CMW 500 to switch to the low channel.
77. Enable the voltage to the EUT, and connect a link to the CMW 500 test set.
78. EUT is commanded to Transmit 100 Bursts.
79. 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.
80. The CMW 500 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
81. Repeat steps 5 to 10 changing the supply voltage to 3.8 Volts
82. Increase temperature by 10°C and soak for 1/2 hour.
83. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
84. Repeat steps 5 to 10 changing the supply voltage to 4.35 volts

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


The maximum frequency error in the LTE Band 30 measured was **0.0093 PPM**.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Date of test: August 25, 2015

LTE Band 30 results (10MHz Bandwidth): channels 27710 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
27710	2310.00	3.6	20	-4.79	-0.0021
27710	2310.00	3.8	20	-5.75	-0.0025
27710	2310.00	4.35	20	-7.08	-0.0031

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 8B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


LTE Band 30 Results (10MHz Bandwidth): channel 27710 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
27710	704	3.6	-30	-8.23	-0.0036
27710	704	3.6	-20	-5.49	-0.0024
27710	704	3.6	-10	-6.04	-0.0026
27710	704	3.6	0	-7.52	-0.0033
27710	704	3.6	10	-5.89	-0.0026
27710	704	3.6	20	-4.79	-0.0021
27710	704	3.6	30	-6.34	-0.0027
27710	704	3.6	40	-8.45	-0.0037
27710	704	3.6	50	-8.51	-0.0037
27710	704	3.6	60	-7.28	-0.0032

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
27710	704	3.8	-30	21.59	0.0093
27710	704	3.8	-20	-6.28	-0.0027
27710	704	3.8	-10	-5.05	-0.0022
27710	704	3.8	0	-6.19	-0.0027
27710	704	3.8	10	-7.32	-0.0032
27710	704	3.8	20	-5.75	-0.0025
27710	704	3.8	30	-6.98	-0.0030
27710	704	3.8	40	-8.41	-0.0036
27710	704	3.8	50	-6.41	-0.0028
27710	704	3.8	60	-7.80	-0.0034

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
27710	704	4.35	-30	-5.85	-0.0025
27710	704	4.35	-20	-7.38	-0.0032
27710	704	4.35	-10	-4.98	-0.0022
27710	704	4.35	0	-5.75	-0.0025
27710	704	4.35	10	-5.19	-0.0022
27710	704	4.35	20	-7.08	-0.0031
27710	704	4.35	30	-7.77	-0.0034
27710	704	4.35	40	-6.98	-0.0030
27710	704	4.35	50	-7.65	-0.0033
27710	704	4.35	60	-7.67	-0.0033

APPENDIX 8C – LTE Band 30 RADIATED EMISSIONS TEST DATA

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW (STV100-2) APPENDIX 8C	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Radiated Power Test Data Results

The following configurations were measured for model RHK211LW (STV100-1):

The following measurements were performed by Shiva Kumbham.

Date of Test: August 7, 2015

The environmental tests conditions were: Temperature: 25.5 °C
Relative Humidity: 35.6 %

The BlackBerry® smartphone was standalone, with horizontal top pointing up 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 3-4 meters height.

LTE Band 30, 5MHz BW, RB=1, QPSK modulation

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V, H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Li mit (dBm)	Diff. To Limit (dB)
										(dB m)	(W)		
F0	23035	2307.50	30	Horn	V	-31.97	-28.94	V-V	-10.99	23.46	0.22	24.00	0.54
F0	23035	2307.50	30	Horn	H	-28.94		H-H	-12.37				
F0	23095	2310.00	30	Horn	V	-31.65	-28.91	V-V	-10.95	23.36	0.22	24.00	0.64
F0	23095	2310.00	30	Horn	H	-28.91		H-H	-12.35				
F0	23154	2312.40	30	Horn	V	-31.47	-28.76	V-V	-10.70	23.52	0.22	24.00	0.48
F0	23154	2312.40	30	Horn	H	-28.76		H-H	-11.82				

LTE Band 30, 10MHz BW, RB=1, 16QAM modulation

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V, H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole)		Li mit (dBm)	Diff. To Limit (dB)
										(dB m)	(W)		
F0	27710	2310.00	30	Horn	V	-30.23	-29.28	V-V	-11.36	22.95	0.20	24.00	1.05
F0	27710	2310.00	30	Horn	H	-29.28		H-H	-12.72				

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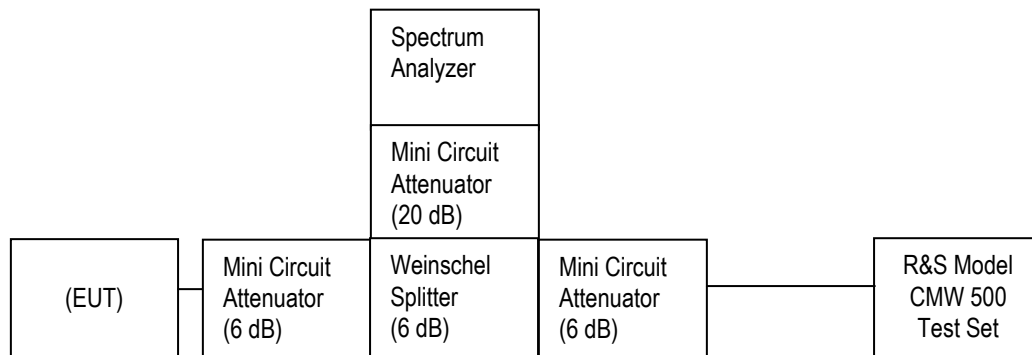
APPENDIX 9A– LTE Band 13 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 13 Conducted RF Emission Test Data

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

Test Setup Diagram



The following configurations were measured for model RHT181LW(STV100-2):

Date of Test: October 7 - 8, 2015


The environmental test conditions were: Temperature: 18.5 – 19.0 °C
Relative Humidity: 47.6 – 52.1 %

The following measurements were performed by Landon Martin.

Emission Designator Table

Frequency Range (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)	Emission Designator	Band	Bandwidth (MHz)	Modulation
779.5-784.4	23.38	0.22	4M48G7D	LTE B12	5	QPSK
779.5-784.4	23.37	0.22	4M47D7W	LTE B12	5	16QAM
782-782	23.37	0.22	8M92G7D	LTE B12	10	QPSK
782-782	23.69	0.23	8M94D7W	LTE B12	10	16QAM

The following test configurations were measured on RHT181LW(STV100-2):


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

The conducted spurious emissions – As per 47 CFR 2.1051, 27.53(c), RSS-130, 4.6 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 RBs for LTE Band 13. QPSK and 16-QAM modulations were applied to each of the bandwidths. Only the worst case measurements are documented in this report. A minimum RB 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 13 was measured to be 9.23 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.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Test Data for LTE Band 13 selected Frequencies in 5MHz BW QPSK (RB = 25)

LTE Band 13 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
777	-	4.483
782	-	4.471
787	-	4.483

Test Data for LTE Band 13 selected Frequencies in 5MHz BW 16-QAM (RB = 25)

LTE Band 13 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
777	4.60	4.471
782	4.65	4.471
787	4.62	4.471

Test Data for LTE Band 13 selected Frequencies in 10MHz BW QPSK (RB = 50)

LTE Band 13 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
782	9.23	8.918

Test Data for LTE Band 13 selected Frequencies in 10MHz BW 16-QAM (RB = 50)

LTE Band 13 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
782	-	8.942

Peak to Average Ratio (PAR)

For each 5MHz and 10MHz with Resource Block allocation 50,25 and 15 as per scalable bandwidths for LTE Band 13, the peak to average ratio was measured on the middle channel with QPSK modulation.

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

The worst case measured was 10.64 dB on 10MHz bandwidth with Resource Block allocation 50 while transmitting at 782 MHz.


Measurement Plots for LTE Band 13

See Figures 9-40a to 9-51a for the plots of the conducted spurious emissions.

See Figures 9-52a to 9-65a for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.

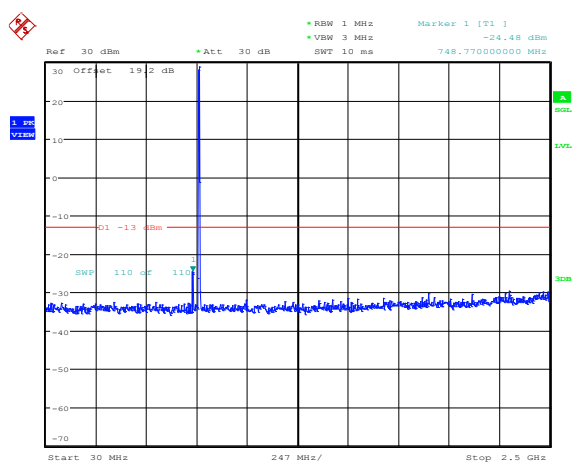
See Figures 9-66a to 9-73a for the plots of the Channel mask.

See Figures 9-74a to 9-77a for the plots of the Peak to Average Ratio.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

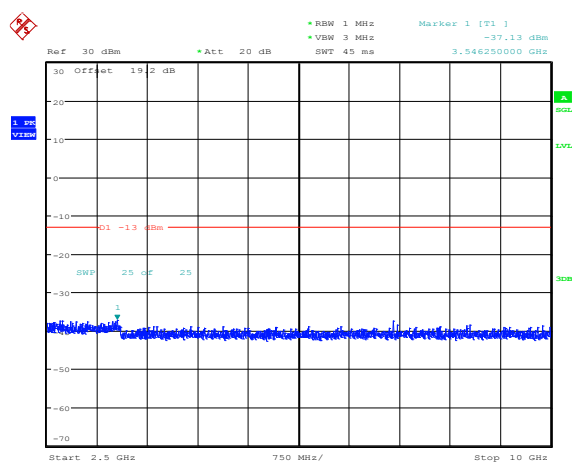
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-40a: Band 13, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)



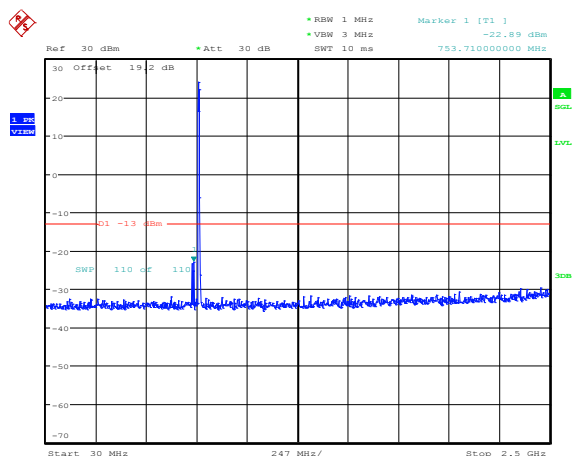
Date: 7.OCT.2015 13:21:08

Figure 9-41a: Band 13, Spurious Conducted Emissions, Low channel, 10MHz BW (RB= 1)



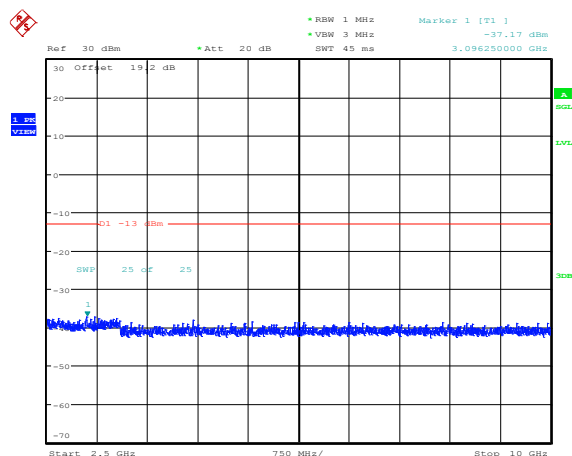
Date: 7.OCT.2015 13:21:13

Figure 9-42a: Band 13, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)




Date: 7.OCT.2015 13:21:25

Figure 9-43a: Band 13, Spurious Conducted Emissions, Middle channel, 10MHz BW (RB= 25)

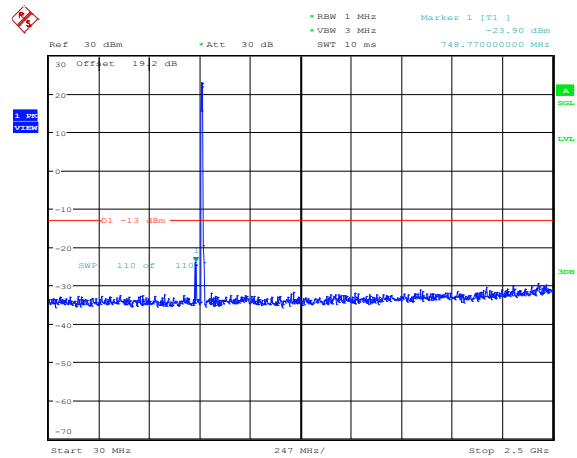


Date: 7.OCT.2015 13:21:31

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

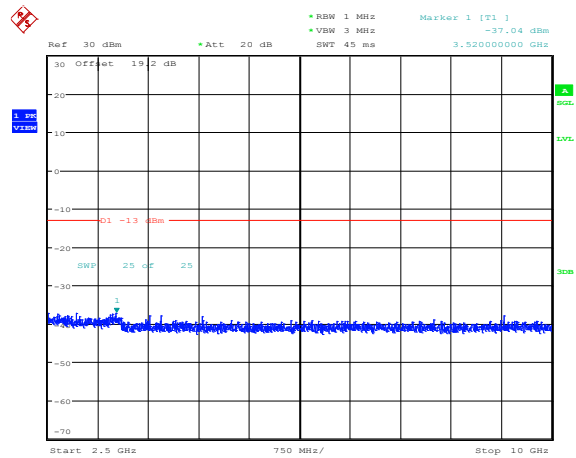
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-44a: Band 13, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)



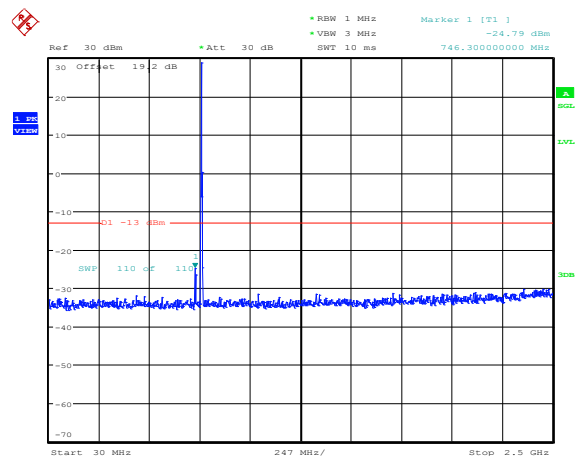
Date: 7.OCT.2015 13:21:43

Figure 9-45a: Band 13, Spurious Conducted Emissions, High Channel, 10MHz BW (RB= 50)



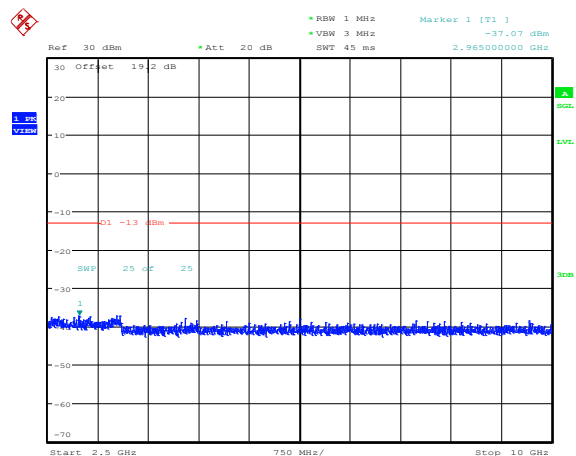
Date: 7.OCT.2015 13:21:48

Figure 9-46a: Band 13, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)




Date: 7.OCT.2015 13:22:09

Figure 9-47a: Band 13, Spurious Conducted Emissions, Low channel, 5MHz BW (RB= 1)

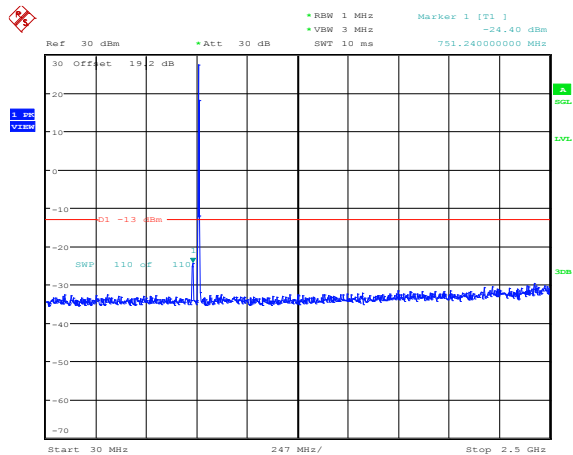


Date: 7.OCT.2015 13:22:14

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

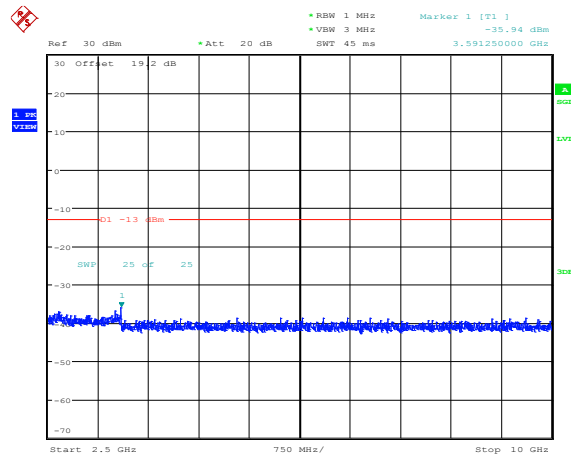
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-48a: Band 13, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)



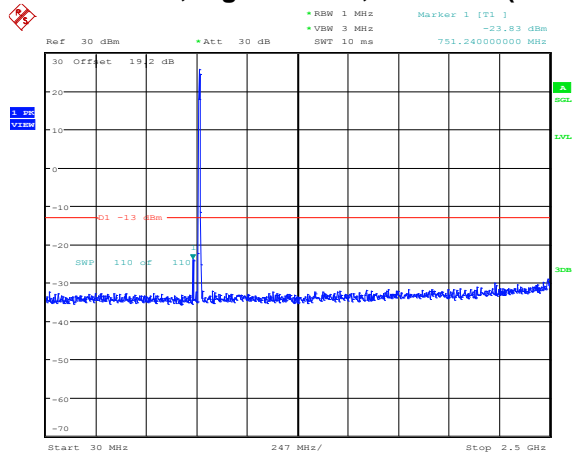
Date: 7.OCT.2015 13:22:35

Figure 9-49a: Band 13, Spurious Conducted Emissions, Middle Channel, 5MHz BW (RB= 15)



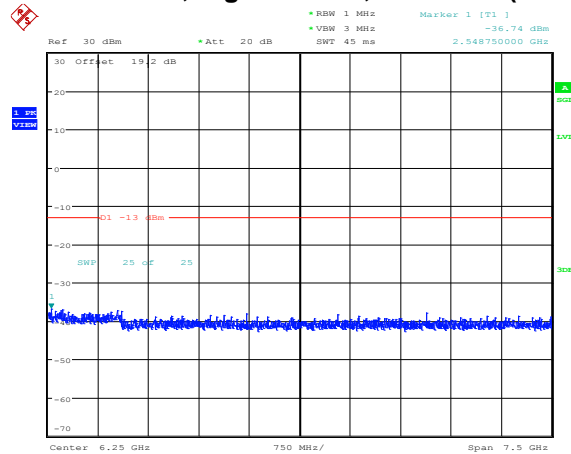
Date: 7.OCT.2015 13:22:41

Figure 9-50a: Band 13, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)




Date: 7.OCT.2015 13:22:53

Figure 9-51a: Band 13, Spurious Conducted Emissions, High channel, 5MHz BW (RB= 25)

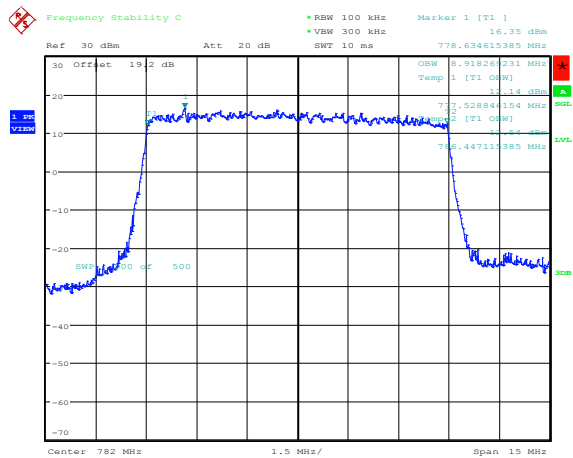


Date: 23.OCT.2015 14:16:44

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

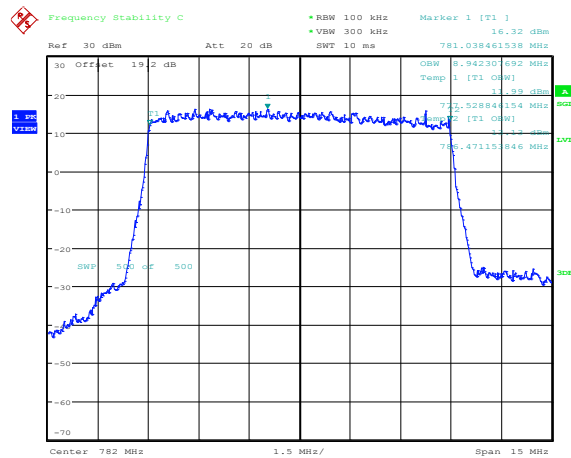
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-52a: Occupied Bandwidth, Band 13 Middle Channel, 10MHz BW, RB=50



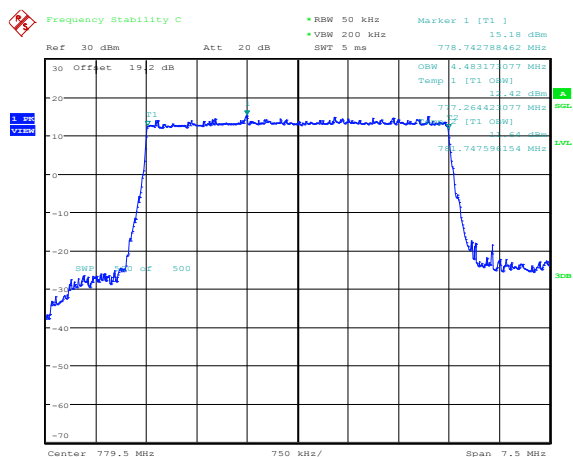
Date: 7.OCT.2015 15:07:50

Figure 9-53a: Occupied Bandwidth, Band 13 Middle Channel, 10MHz BW, RB=50



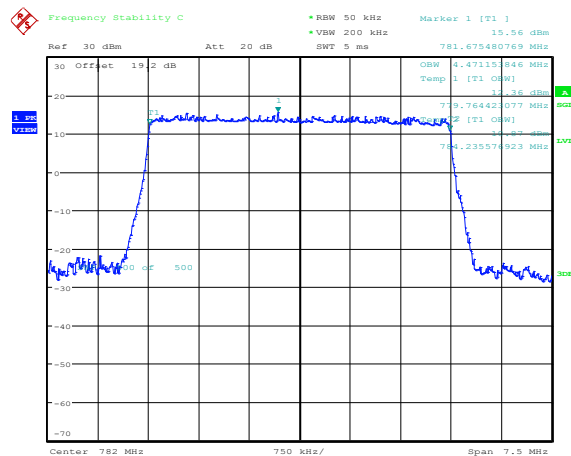
Date: 7.OCT.2015 15:08:14

Figure 9-54a: Occupied Bandwidth, Band 13 Low Channel, 5MHz BW, RB=50




Date: 7.OCT.2015 15:08:38

Figure 9-55a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=50

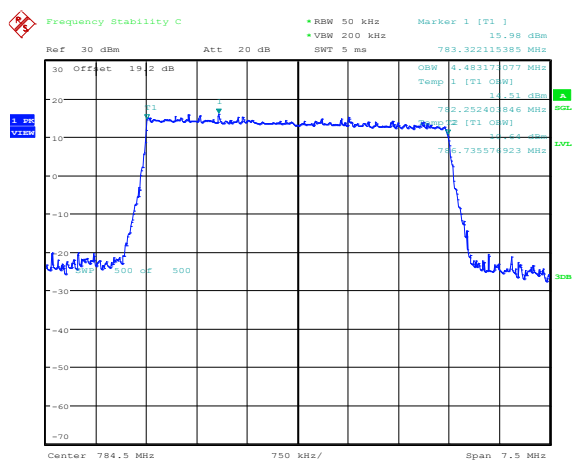


Date: 7.OCT.2015 15:08:55

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

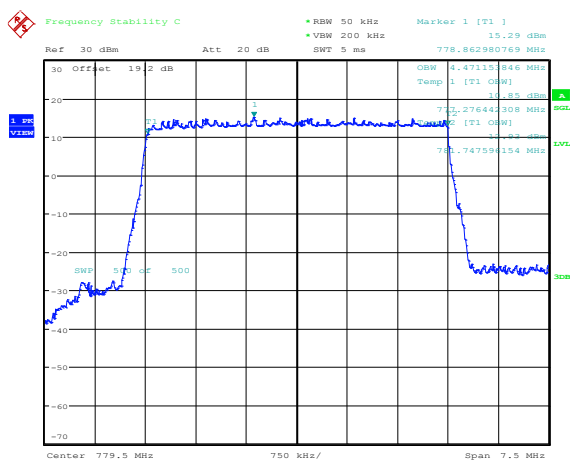
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-56a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=50



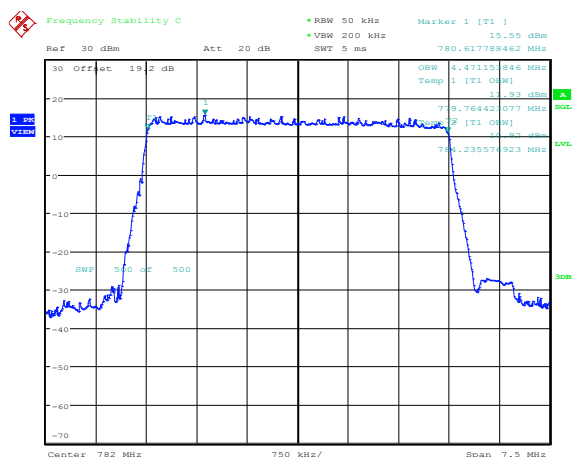
Date: 7.OCT.2015 15:09:16

Figure 9-57a: Occupied Bandwidth, Band 5 Low Channel, 5MHz BW, RB=50



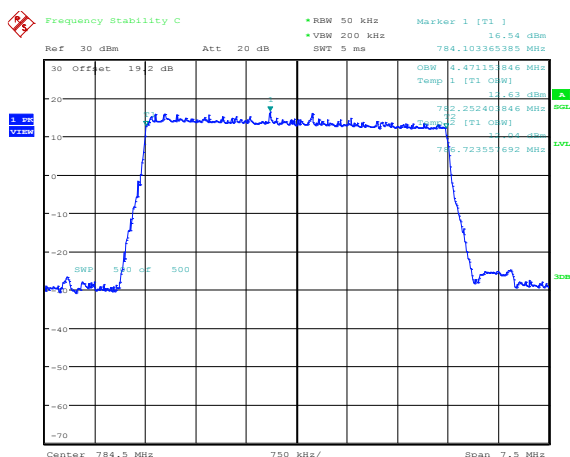
Date: 7.OCT.2015 15:09:32

Figure 9-58a: Occupied Bandwidth, Band 5 Middle Channel, 5MHz BW, RB=50




Date: 7.OCT.2015 15:09:49

Figure 9-59a: Occupied Bandwidth, Band 5 High Channel, 5MHz BW, RB=50

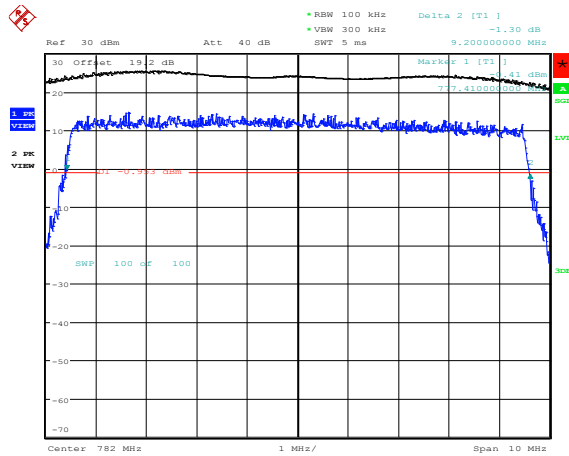


Date: 7.OCT.2015 15:10:09

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

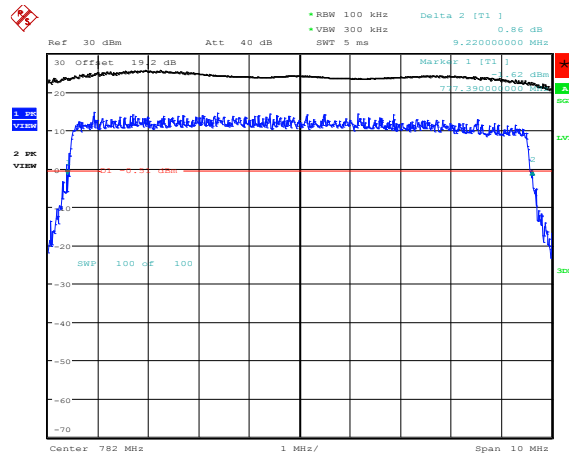
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-60a: -26 dBc Bandwidth, Band 13 Low Channel, 10MHz BW, RB=50



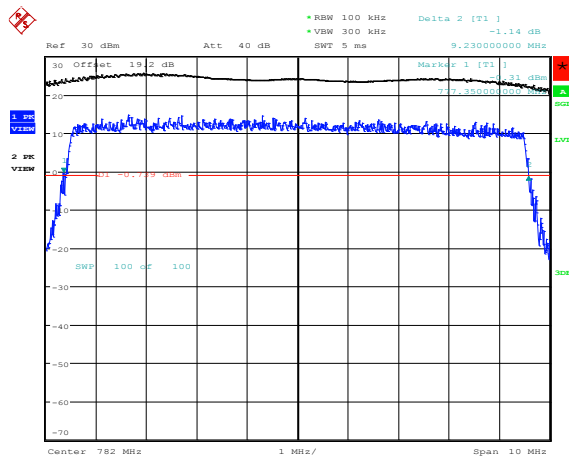
Date: 7.OCT.2015 14:53:30

Figure 9-61a: -26 dBc Bandwidth, Band 13 Middle Channel, 10MHz BW, RB=50



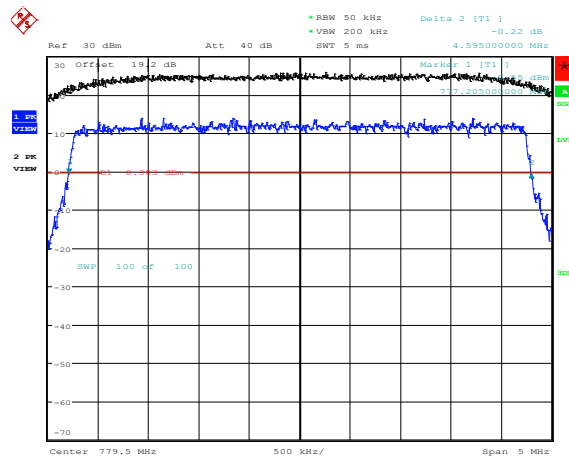
Date: 7.OCT.2015 14:53:43

Figure 9-62a: -26 dBc Bandwidth, Band 13 High Channel, 10MHz BW, RB=50




Date: 7.OCT.2015 14:53:57

Figure 9-63a: -26 dBc Bandwidth, Band 13 Low Channel, 5MHz BW, RB=25

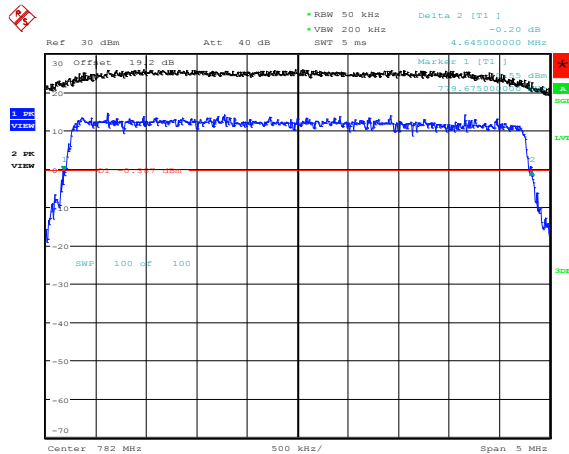


Date: 7.OCT.2015 14:54:19

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

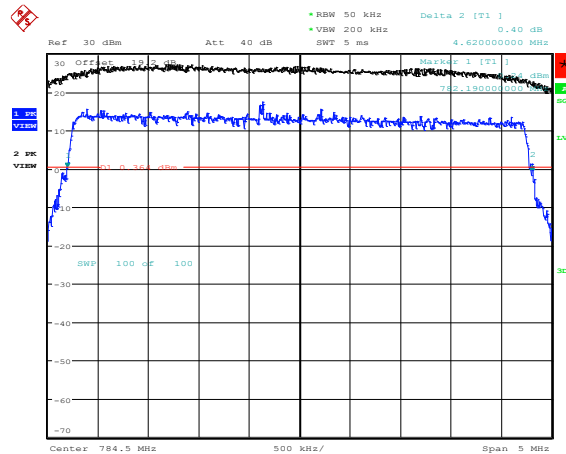
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-64a: -26 dBc Bandwidth, Band 13 Middle Channel, 5MHz BW, RB=25



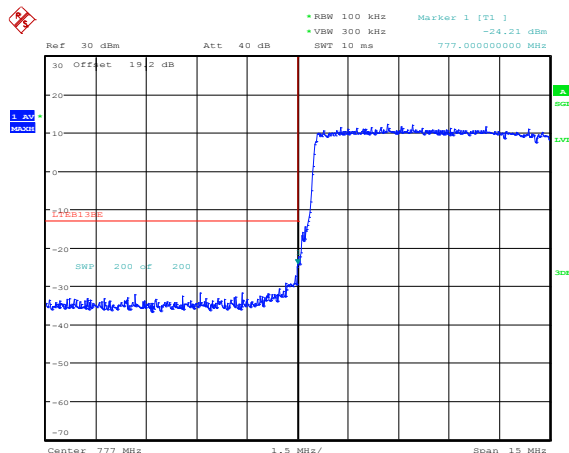
Date: 7.OCT.2015 14:54:32

Figure 9-65a: -26 dBc Bandwidth, Band 13 High Channel, 5MHz BW, RB=25



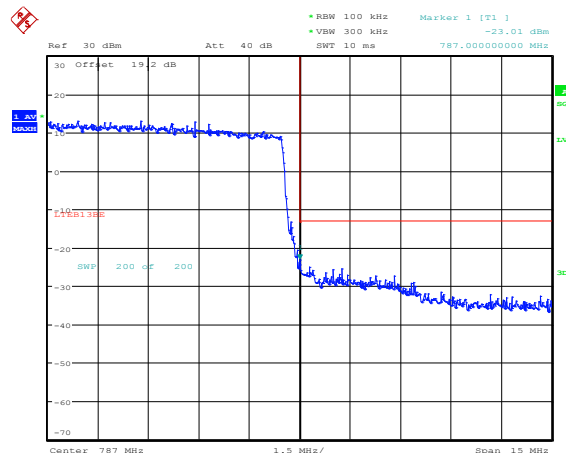
Date: 7.OCT.2015 14:54:46

Figure 9-66a: Band 13 Middle Channel Mask, 10MHz BW, RB=50




Date: 7.OCT.2015 15:41:39

Figure 9-67a: Band 13 Middle Channel Mask, 10MHz BW, RB=50

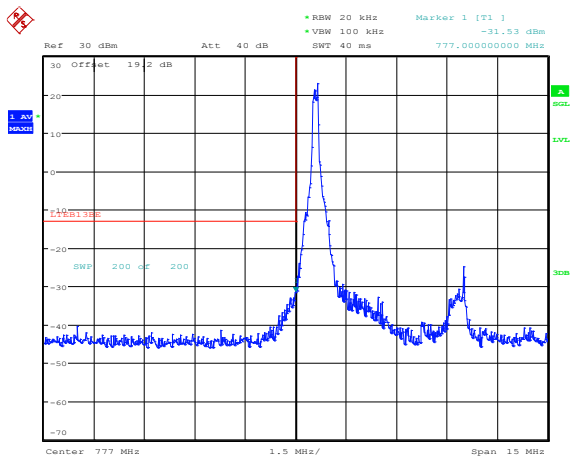


Date: 7.OCT.2015 15:42:09

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

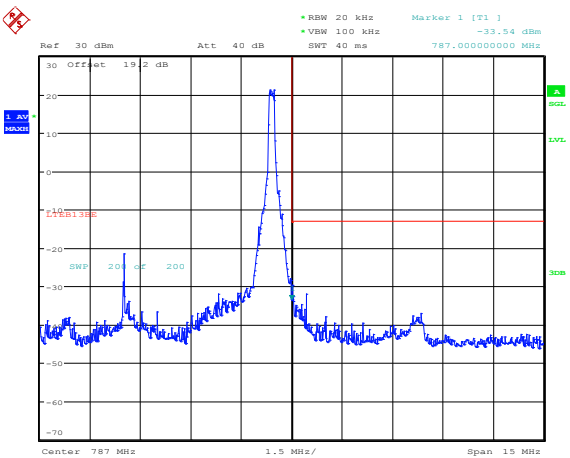
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-68a: Band 13 Middle Channel Mask, 10MHz BW, RB=1



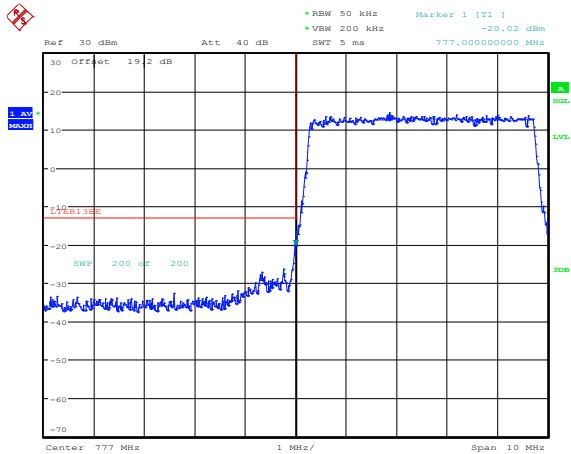
Date: 7.OCT.2015 15:41:27

Figure 9-69a: Band 13 Middle Channel Mask, 10MHz BW, RB=1



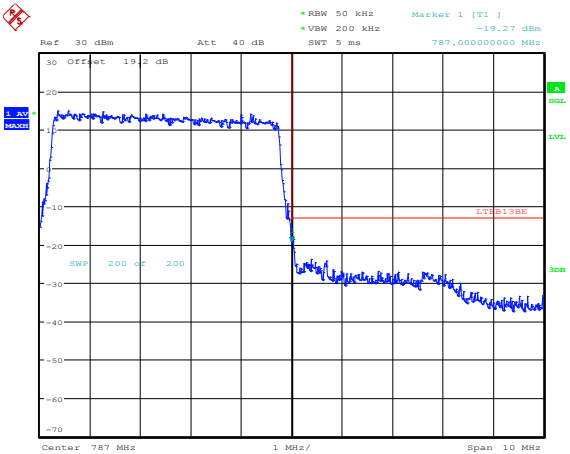
Date: 7.OCT.2015 15:41:57

Figure 9-70a: Band 13 Low Channel Mask, 5MHz BW, RB=25




Date: 7.OCT.2015 15:42:43

Figure 9-71a: Band 13 High Channel Mask, 5MHz BW, RB=25

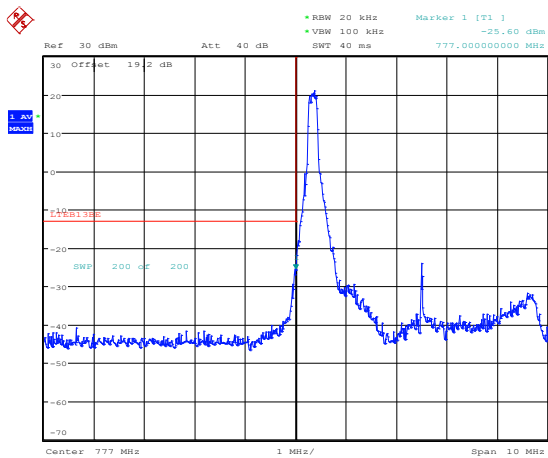


Date: 7.OCT.2015 15:43:12

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

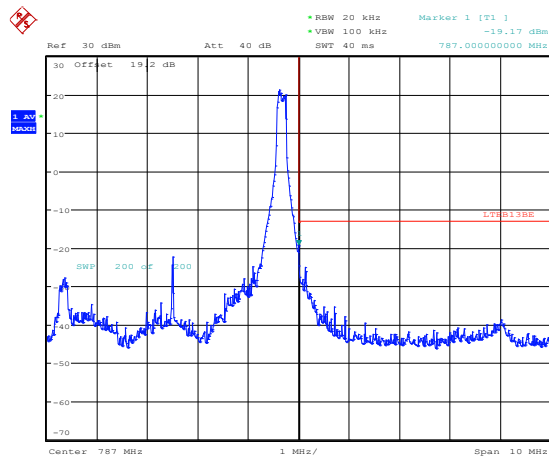
LTE Band 13 Conducted RF Emission Test Data cont'd

Figure 9-72a: Band 13 Low Channel Mask, 5MHz BW, RB=1



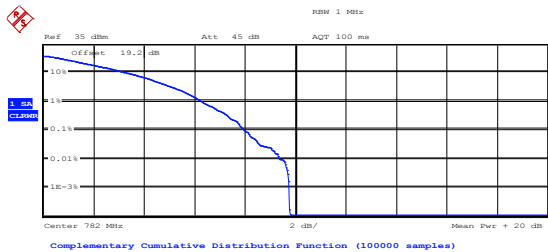
Date: 7.OCT.2015 15:42:34

Figure 9-73a: Band 13 High Channel Mask, 5MHz BW, RB=1



Date: 7.OCT.2015 15:43:01

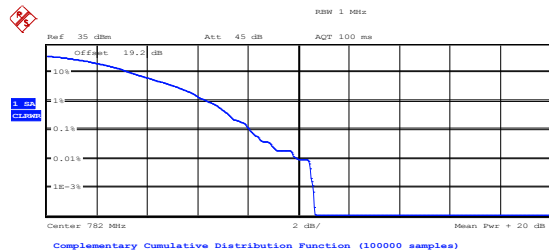
Figure 9-74a: Band 13 Mid Channel PAR, 10MHz BW, RB=25



Trace 1
Mean 13.39 dBm
Peak 23.15 dBm
Crest 9.76 dB
10 % 3.33 dB
1 % 6.25 dB
.1 % 7.95 dB
.01 % 9.42 dB


Date: 7.OCT.2015 15:22:20

Figure 9-75a: Band 13 Middle Channel PAR, 10MHz BW, RB=50



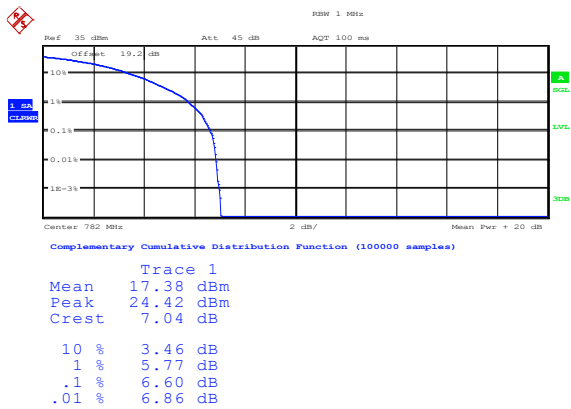
Trace 1
Mean 14.14 dBm
Peak 24.78 dBm
Crest 10.64 dB
10 % 3.37 dB
1 % 6.41 dB
.1 % 8.08 dB
.01 % 10.29 dB

Date: 7.OCT.2015 15:22:25

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

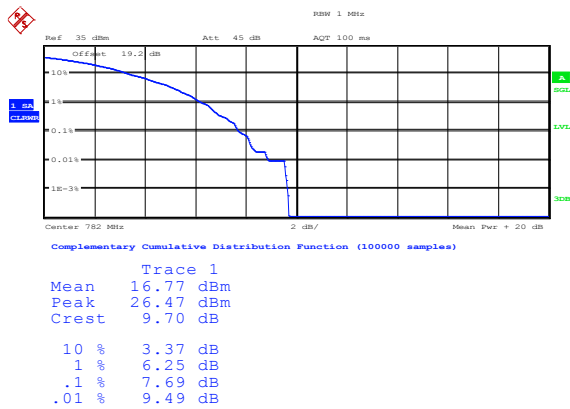
LTE Band 13 Conducted RF Emission Test Data cont'd

**Figure 9-76a: Band 13 Mid Channel PAR, 5MHz
BW, RB=15**



Date: 7.OCT.2015 15:22:38

**Figure 9-77a: Band 13 Mid Channel PAR, 5MHz
BW, RB=25**

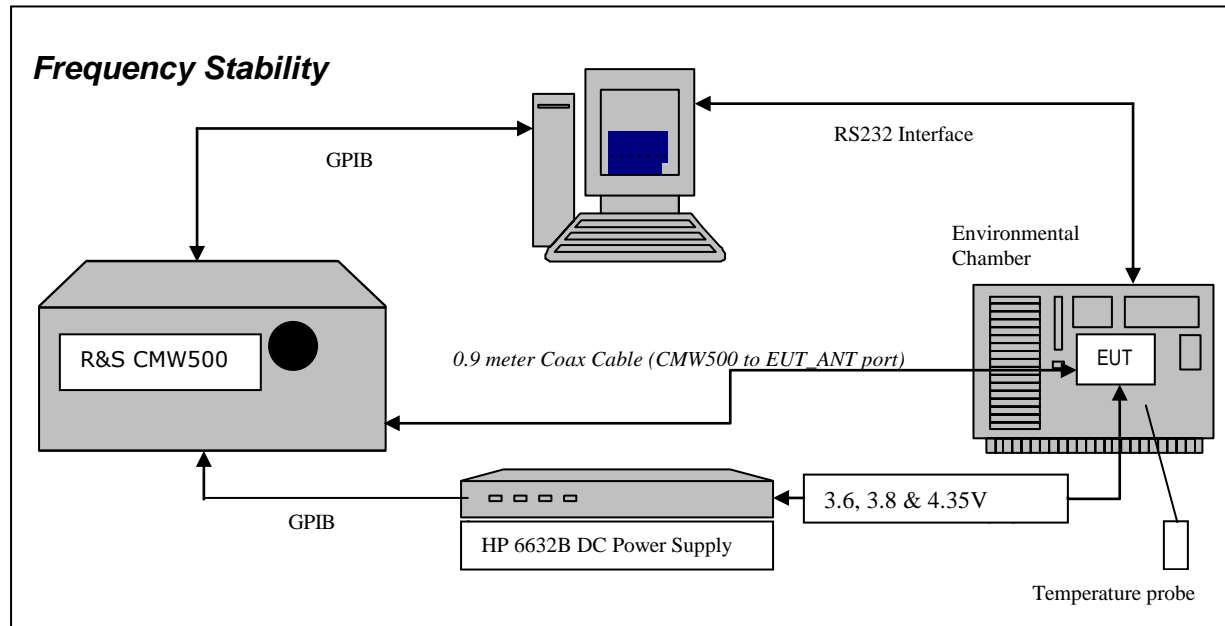


Date: 7.OCT.2015 15:22:43

APPENDIX 9B – LTE Band 13 FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 13 Frequency Stability Test Data




The following configurations were measured for model RHT181LW(STV100-2):

Date of test: August 25, 2015

LTE Band 13 results (10MHz Bandwidth): channels 23230 @ 20°C maximum transmitted power

Traffic Channel Number	LTE Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23230	782.00	3.6	20	2.70	0.0035
23230	782.00	3.8	20	-1.76	-0.0023
23230	782.00	4.35	20	1.93	0.0025

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 9B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

LTE Band 13 Results (10MHz Bandwidth): channel 23230 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23230	782	3.6	-30	-2.98	-0.0038
23230	782	3.6	-20	3.05	0.0039
23230	782	3.6	-10	3.30	0.0042
23230	782	3.6	0	-1.52	-0.0019
23230	782	3.6	10	3.29	0.0042
23230	782	3.6	20	2.70	0.0035
23230	782	3.6	30	-3.68	-0.0047
23230	782	3.6	40	-3.02	-0.0039
23230	782	3.6	50	-5.52	-0.0071
23230	782	3.6	60	-3.02	-0.0039

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23230	782	3.8	-30	-5.19	-0.0066
23230	782	3.8	-20	3.98	0.0051
23230	782	3.8	-10	3.48	0.0044
23230	782	3.8	0	2.22	0.0028
23230	782	3.8	10	3.36	0.0043
23230	782	3.8	20	-1.76	-0.0023
23230	782	3.8	30	-1.37	-0.0018
23230	782	3.8	40	-3.32	-0.0042
23230	782	3.8	50	-4.49	-0.0057
23230	782	3.8	60	-1.42	-0.0018

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
23230	782	4.35	-30	-3.63	-0.0046
23230	782	4.35	-20	3.39	0.0043
23230	782	4.35	-10	3.60	0.0046
23230	782	4.35	0	2.43	0.0031
23230	782	4.35	10	3.35	0.0043
23230	782	4.35	20	1.93	0.0025
23230	782	4.35	30	-2.69	-0.0034
23230	782	4.35	40	3.96	0.0051
23230	782	4.35	50	-3.89	-0.0050
23230	782	4.35	60	-2.06	-0.0026

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APPENDIX 9C – LTE Band 13 RADIATED EMISSIONS TEST DATA

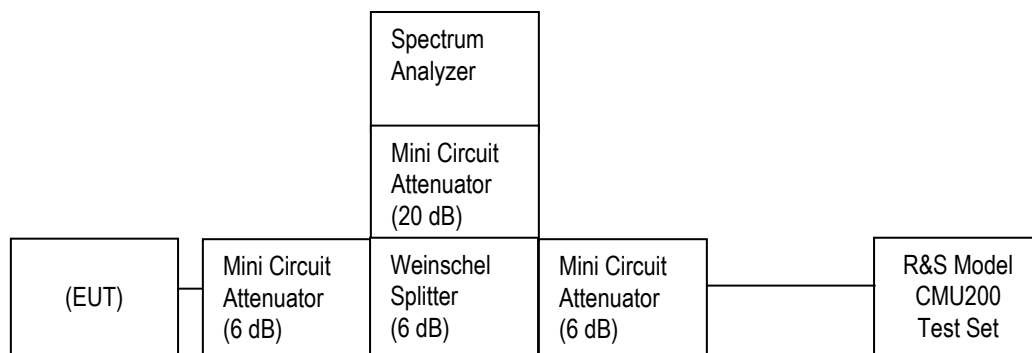
APPENDIX 10A– CDMA CONDUCTED RF EMISSIONS TEST DATA/PLOTS


BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA Conducted RF Emission Test Data

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

Test Setup Diagram



	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA Conducted RF Emission Test Data cont'd

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

Date of Test: October 15, 2015

The environmental test conditions were: Temperature: 20.8 °C
 Relative Humidity: 53.3 %

Test Data for CDMA Cellular and PCS selected Frequencies in Loopback mode

CDMA Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.70	1.286
836.52	1.276
848.31	1.280

CDMA PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.20	1.280
1880.00	1.284
1908.75	1.280

Test Data for CDMA Cellular and PCS selected Frequencies in Loopback mode

Refer to the following measurement plots for more detail.

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

See Figures 12-13a to 12-18a for the plots of 99% Occupied Bandwidth.

See Figures 12-19a to 12-24a for the plots of the Channel mask.

The RF power output was at maximum for all the recorded measurements shown below.

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA Conducted RF Emission Test Data cont'd

Test Data for CDMA Cellular and CDMA PCS selected Frequencies in EVDO mode

Cellular Frequency (MHz)	99% Occupied Bandwidth (MHz)
824.70	1.274
836.52	1.274
848.31	1.272

PCS Frequency (MHz)	99% Occupied Bandwidth (MHz)
1851.20	1.282
1880.00	1.276
1908.75	1.278

Measurement Plots for CDMA Cellular and CDMA PCS in EVDO mode


Refer to the following measurement plots for more detail.

See Figures 12-25a to 12-36a for the plots of the conducted spurious emissions.

See Figures 12-37a to 12-42a for the plots of 99% Occupied Bandwidth.

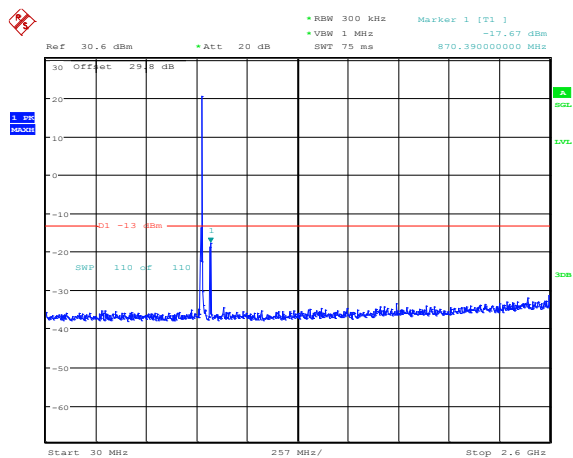
See Figures 12-43a to 12-46a for the plots of the Channel mask.

The RF power output was at maximum for all the recorded measurements shown below.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

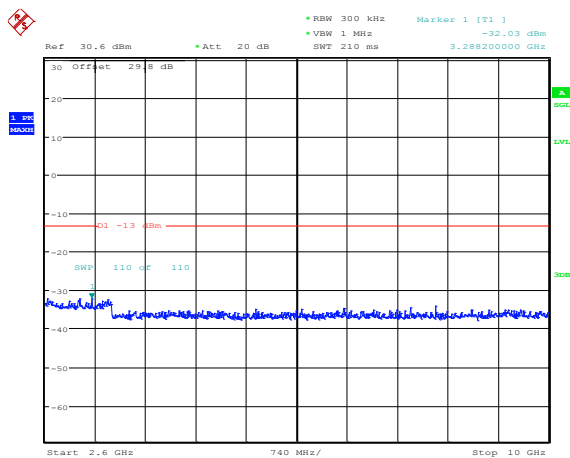
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-1a: Spurious Conducted Emissions
Cellular Loopback mode, Low channel**



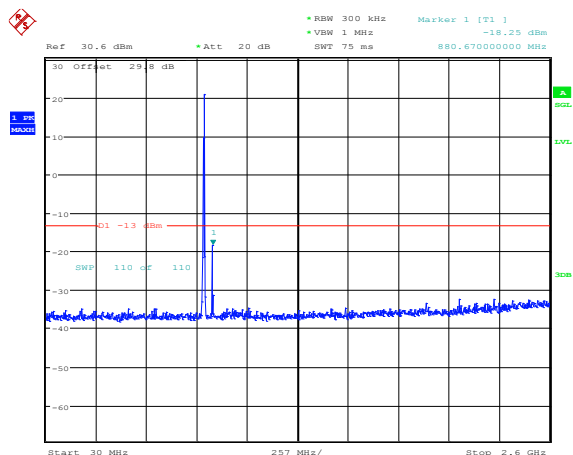
Date: 16.OCT.2015 12:22:33

**Figure 12-2a: Spurious Conducted Emissions
Cellular Loopback mode, Low channel**



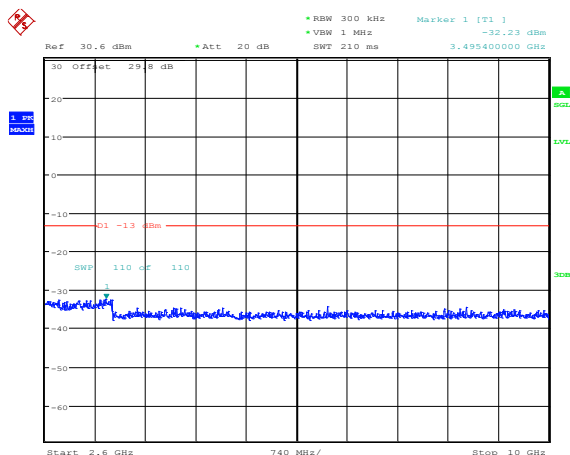
Date: 16.OCT.2015 12:23:13

**Figure 12-3a: Spurious Conducted Emissions
Cellular Loopback mode, Middle channel**




Date: 16.OCT.2015 12:23:30

**Figure 12-4a: Spurious Conducted Emissions
Cellular Loopback mode, Middle channel**

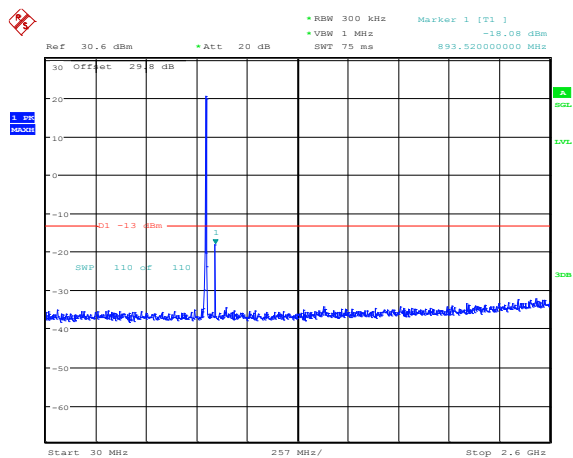


Date: 16.OCT.2015 12:24:08

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

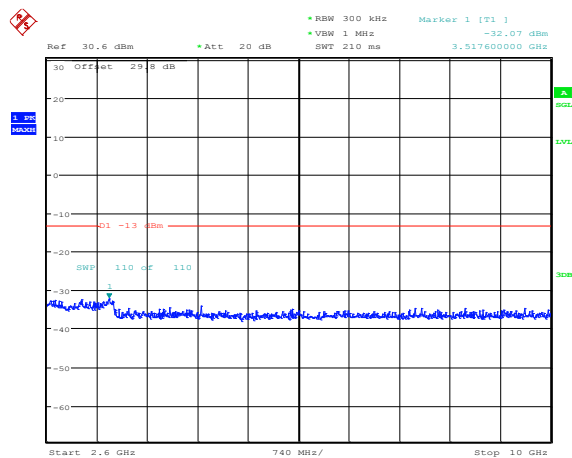
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-5a: Spurious Conducted Emissions
Cellular Loopback mode, High Channel**



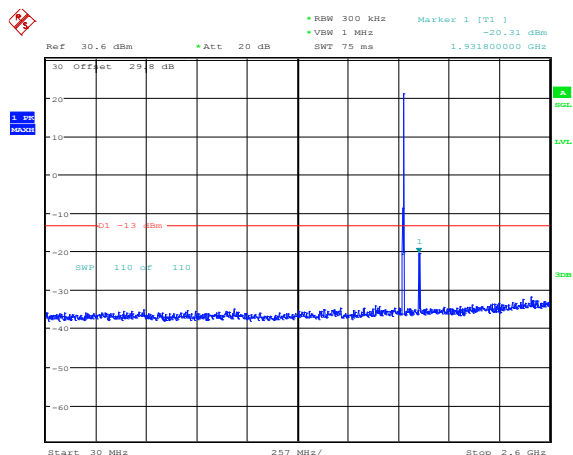
Date: 16.OCT.2015 12:24:24

**Figure 12-6a: Spurious Conducted Emissions
Cellular Loopback mode, High Channel**



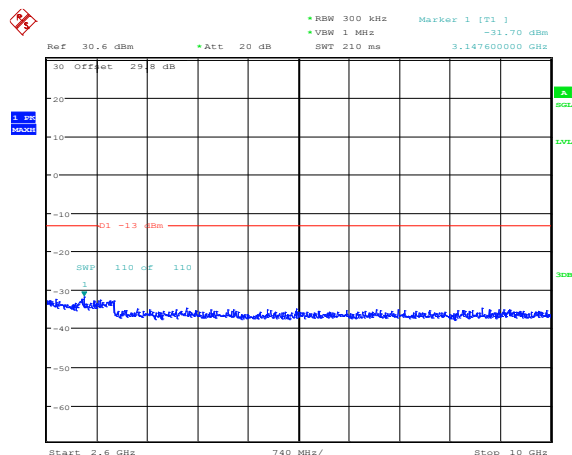
Date: 16.OCT.2015 12:25:21

**Figure 12-7a: Spurious Conducted Emissions
PCS Loopback mode, Low Channel**




Date: 16.OCT.2015 15:41:18

**Figure 12-8a: Spurious Conducted Emissions
PCS Loopback mode, Low Channel**

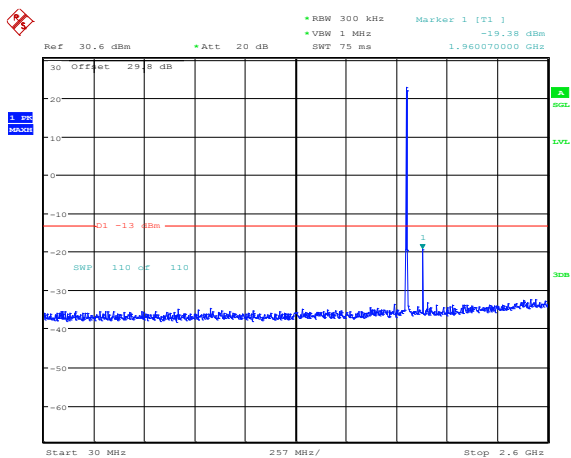


Date: 16.OCT.2015 15:41:56

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

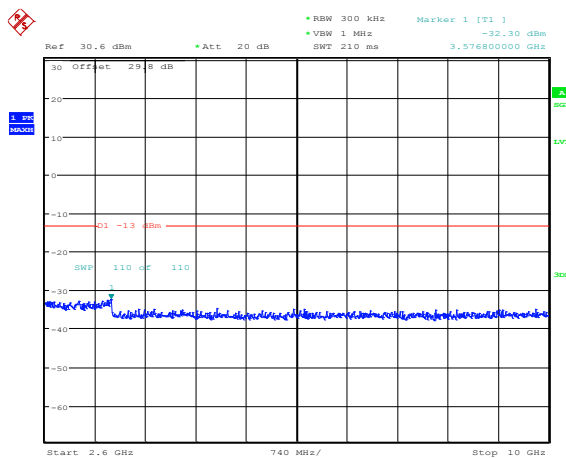
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-9a: Spurious Conducted Emissions
PCS Loopback mode, Middle Channel**



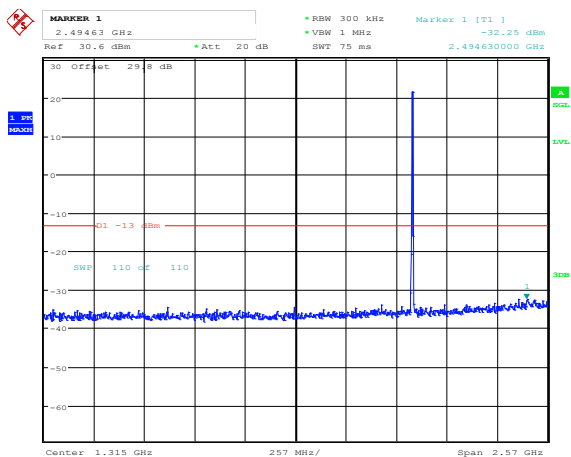
Date: 16.OCT.2015 15:42:14

**Figure 12-10a: Spurious Conducted Emissions
PCS Loopback mode, Middle Channel**



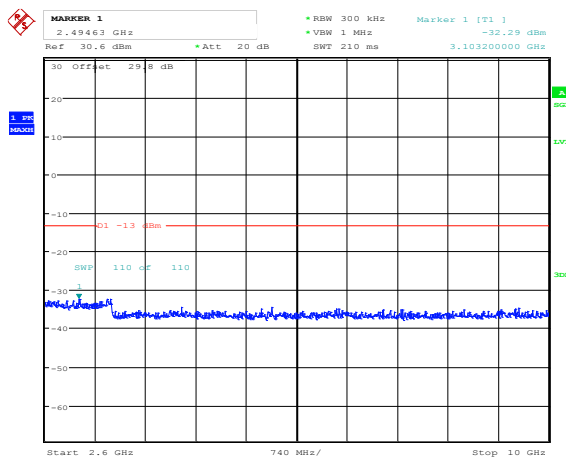
Date: 16.OCT.2015 15:43:01

**Figure 12-11a: Spurious Conducted Emissions
PCS Loopback mode, High Channel**




Date: 16.OCT.2015 15:43:41

**Figure 12-12a: Spurious Conducted Emissions
PCS Loopback mode, High Channel**

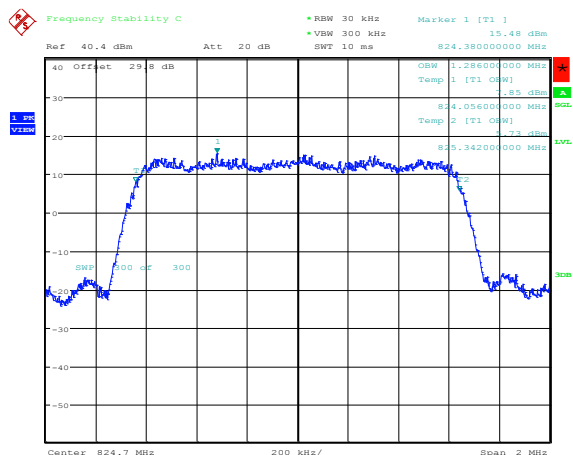


Date: 16.OCT.2015 15:44:22

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

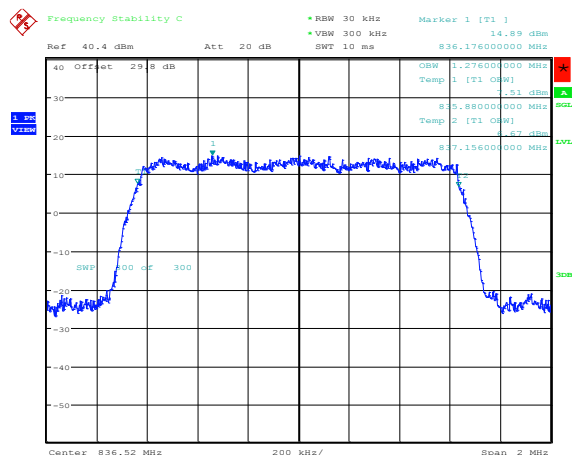
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-13a: Occupied Bandwidth
Cellular Loopback mode, Low Channel**



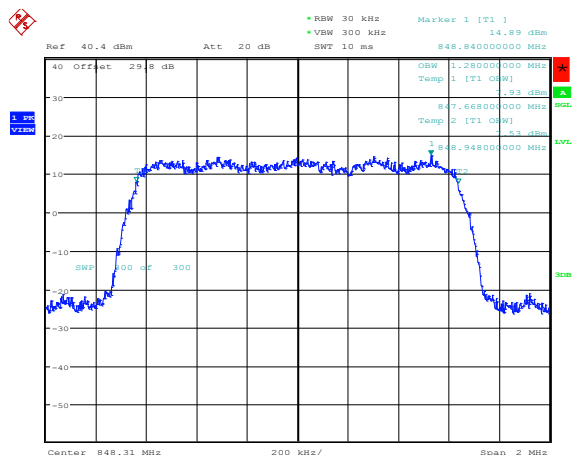
Date: 16.OCT.2015 12:25:35

**Figure 12-14a: Occupied Bandwidth
Cellular Loopback mode, Middle Channel**



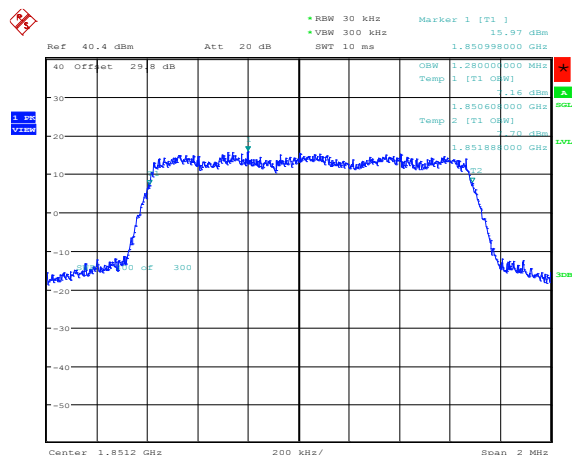
Date: 16.OCT.2015 12:25:57

**Figure 12-15a: Occupied Bandwidth
Cellular Loopback mode, High Channel**




Date: 16.OCT.2015 12:26:39

**Figure 12-16a: Occupied Bandwidth
PCS Loopback mode, Low Channel**

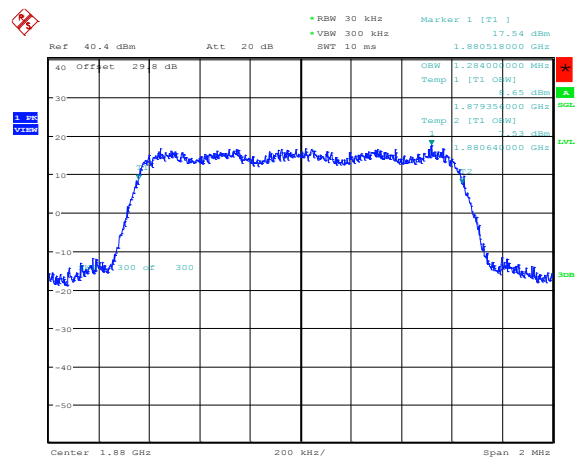


Date: 16.OCT.2015 15:46:09

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

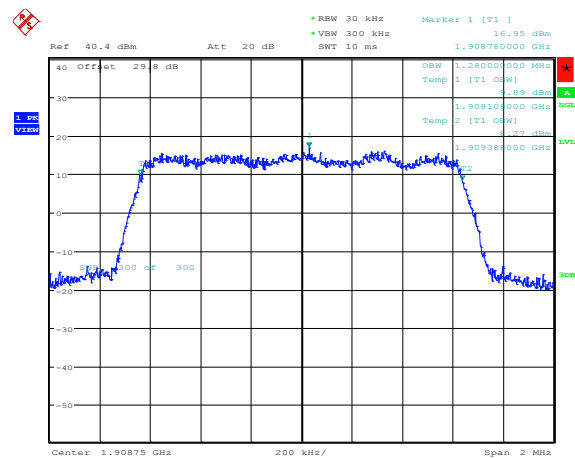
CDMA Conducted RF Emission Test Data cont'd

Figure 12-17a: Occupied Bandwidth
 PCS Loopback mode, Middle Channel



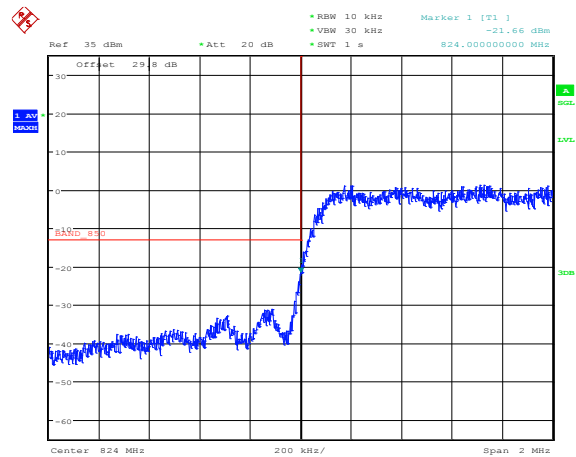
Date: 16.OCT.2015 15:46:24

Figure 12-18a: Occupied Bandwidth
 PCS Loopback mode, High Channel



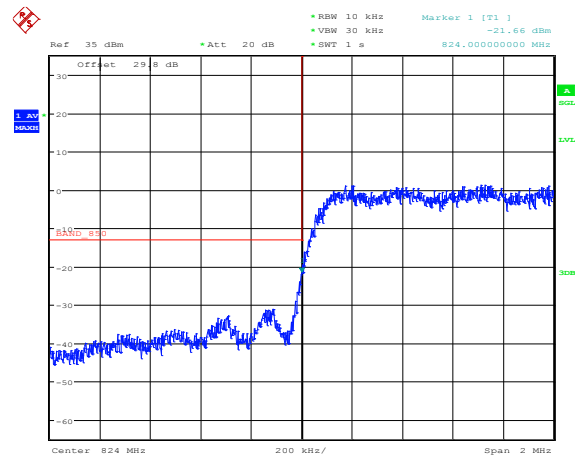
Date: 16.OCT.2015 15:46:47

Figure 12-19a: Low Channel Mask
 Cellular Loopback mode




Date: 16.OCT.2015 12:26:50

Figure 12-20a: Low Channel Mask
 Cellular Loopback mode

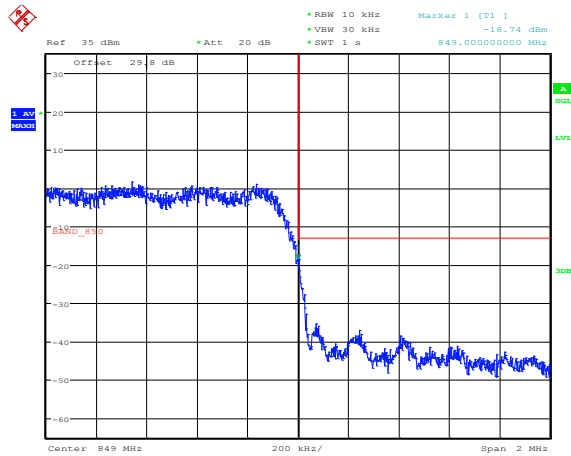


Date: 16.OCT.2015 12:26:50

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

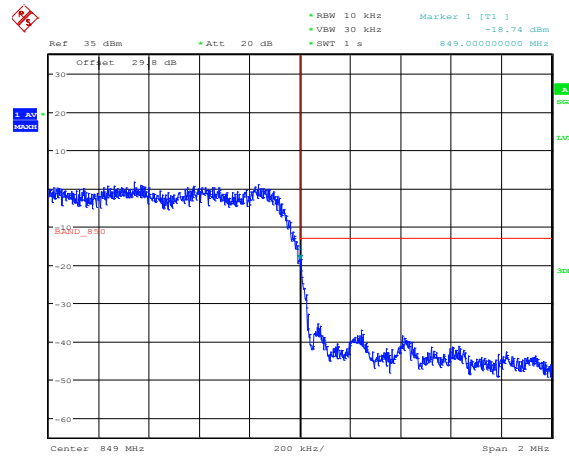
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-21a: High Channel Mask
Cellular Loopback mode**



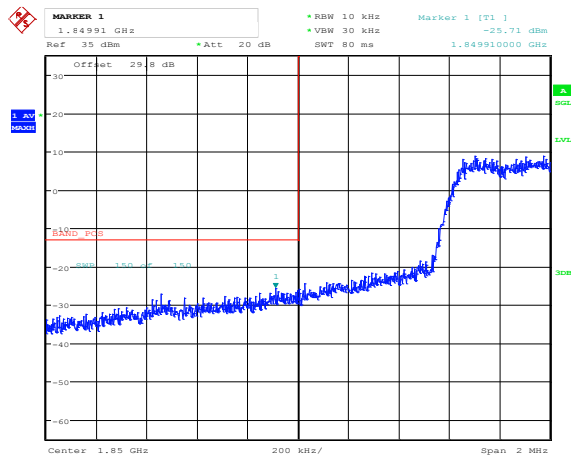
Date: 16.OCT.2015 12:26:58

**Figure 12-22a: High Channel Mask
Cellular Loopback mode**



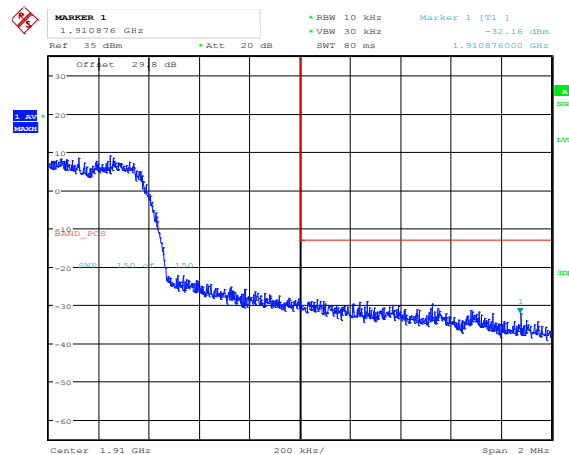
Date: 16.OCT.2015 12:26:58

**Figure 12-23a: Low Channel Mask
PCS Loopback mode**




Date: 21.OCT.2015 11:19:27

**Figure 12-24a: High Channel Mask
PCS Loopback mode**

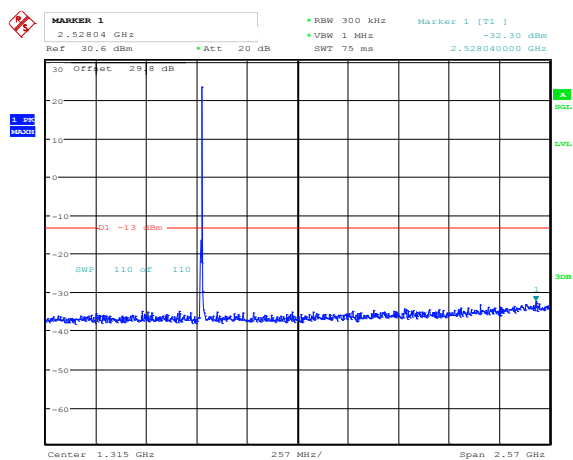


Date: 21.OCT.2015 11:20:38

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

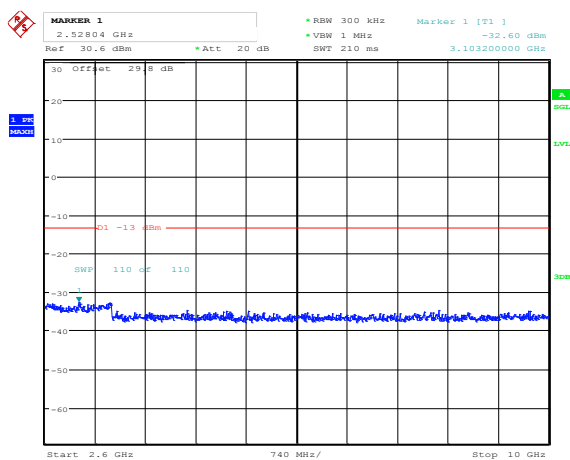
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-25a: Spurious Conducted Emissions
Cellular EVDO mode, Low channel**



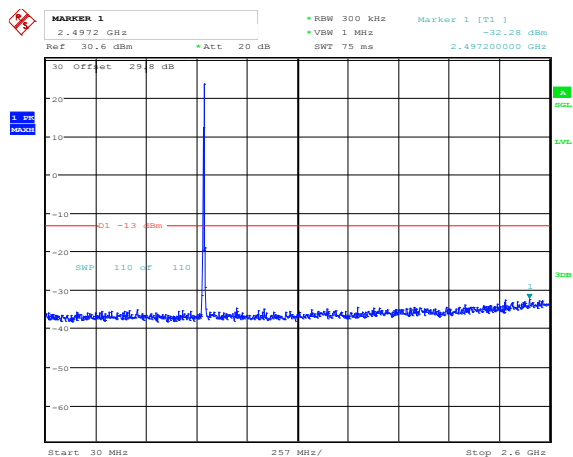
Date: 19.OCT.2015 11:15:48

**Figure 12-26b: Spurious Conducted Emissions
Cellular EVDO mode, Low channel**



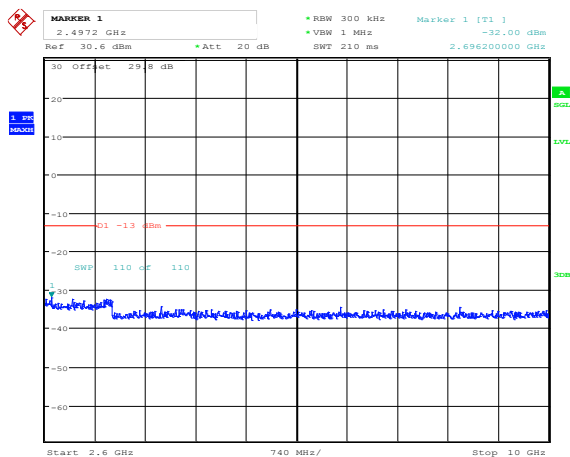
Date: 19.OCT.2015 11:16:37

**Figure 12-27a: Spurious Conducted Emissions
Cellular EVDO mode, Middle channel**




Date: 19.OCT.2015 11:17:12

**Figure 12-28a: Spurious Conducted Emissions
Cellular EVDO mode, Middle channel**

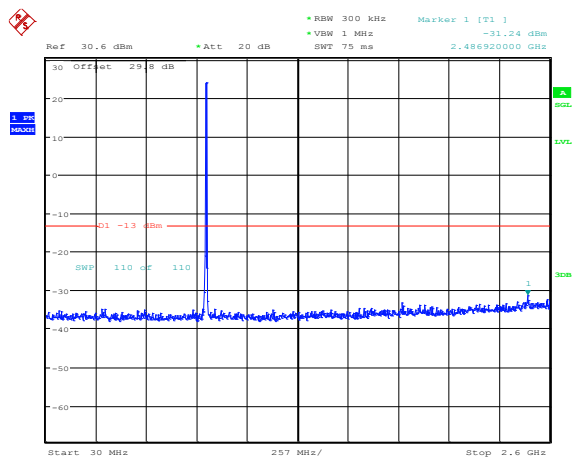


Date: 19.OCT.2015 11:17:51

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

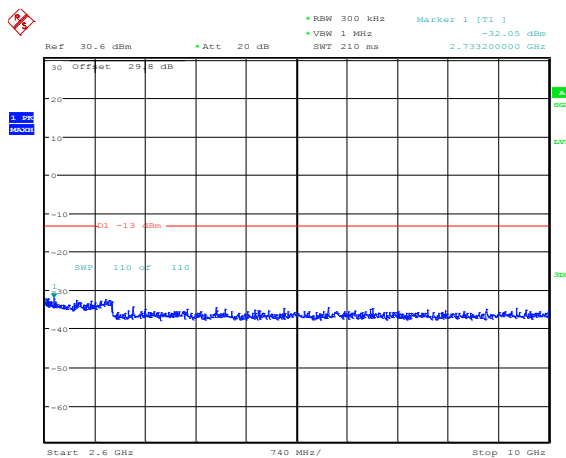
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-29a: Spurious Conducted Emissions
Cellular EVDO mode, High Channel**



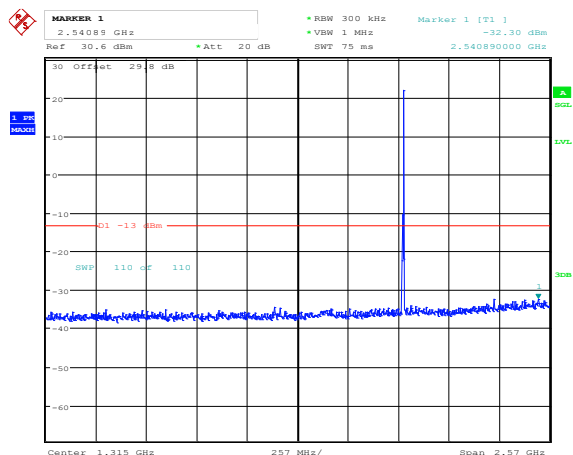
Date: 19.OCT.2015 11:18:10

**Figure 12-30a: Spurious Conducted Emissions
Cellular EVDO mode, High Channel**



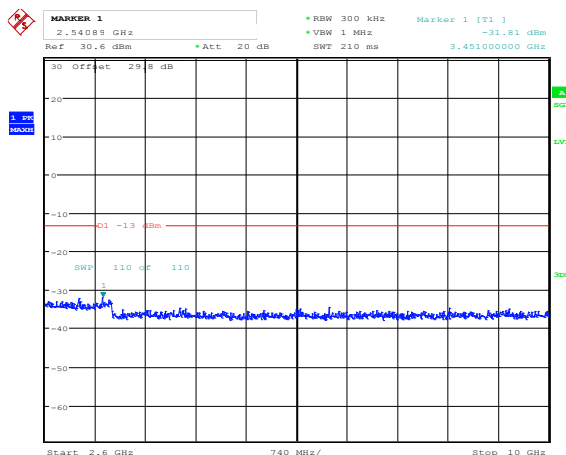
Date: 19.OCT.2015 11:18:55

**Figure 12-31a: Spurious Conducted Emissions
PCS EVDO mode, Low Channel**




Date: 19.OCT.2015 11:34:37

**Figure 12-32a: Spurious Conducted Emissions
PCS EVDO mode, Low Channel**

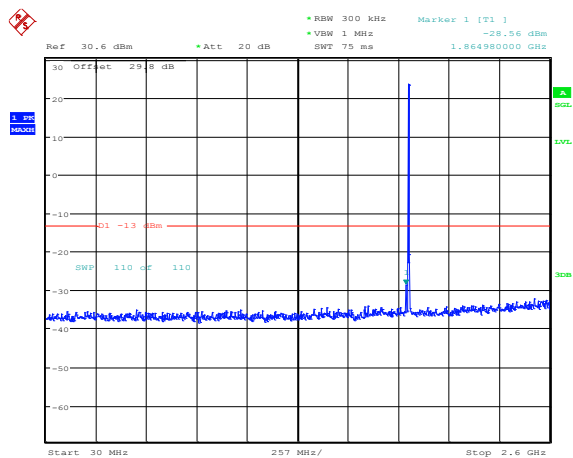


Date: 19.OCT.2015 11:35:24

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

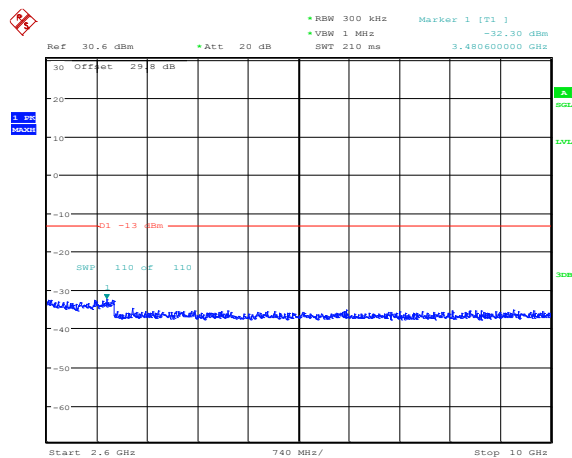
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-33a: Spurious Conducted Emissions
PCS EVDO mode, Middle Channel**



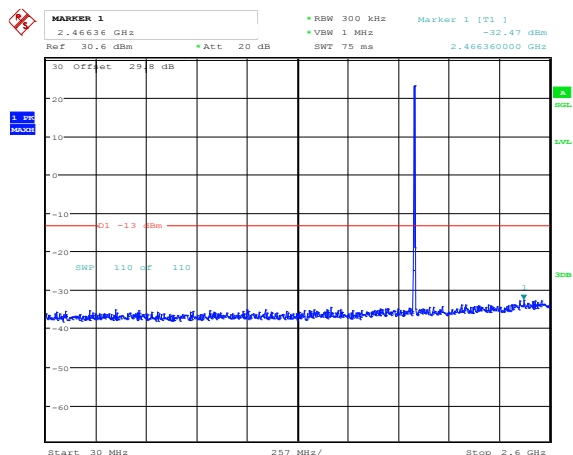
Date: 19.OCT.2015 11:35:40

**Figure 12-34a: Spurious Conducted Emissions
PCS EVDO mode, Middle Channel**



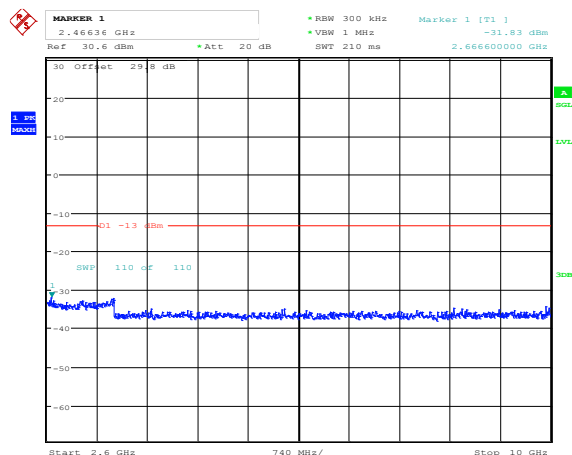
Date: 19.OCT.2015 11:36:22

**Figure 12-35a: Spurious Conducted Emissions
PCS EVDO mode, High Channel**




Date: 19.OCT.2015 11:36:49

**Figure 12-36a: Spurious Conducted Emissions
PCS EVDO mode, High Channel**

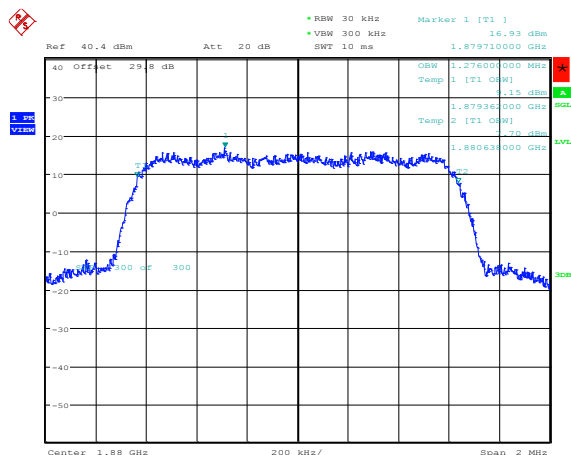


Date: 19.OCT.2015 11:37:28

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

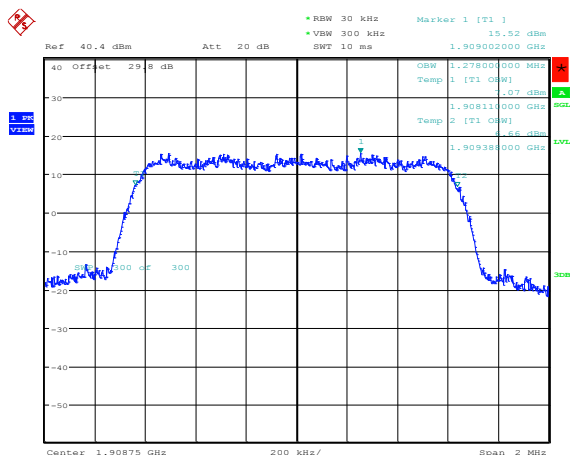
CDMA Conducted RF Emission Test Data cont'd

**Figure 12-41a: Occupied Bandwidth
PCS EVDO mode, Middle Channel**



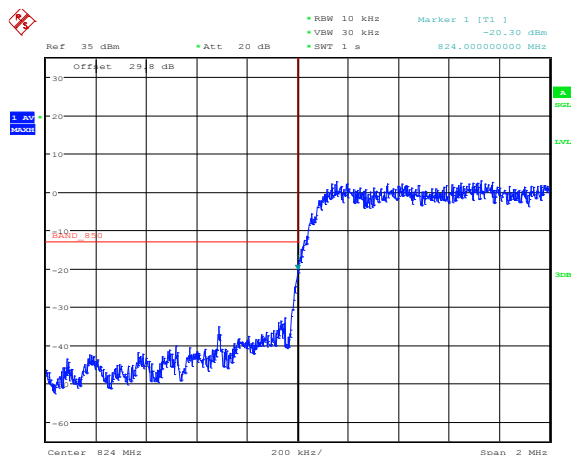
Date: 19.OCT.2015 11:37:55

**Figure 12-42a: Occupied Bandwidth
PCS EVDO mode, High Channel**



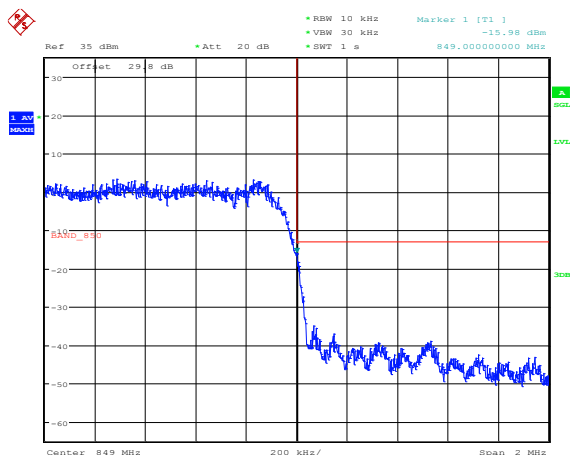
Date: 19.OCT.2015 11:38:28

**Figure 12-43a: Low Channel Mask
Cellular EVDO mode**




Date: 19.OCT.2015 11:20:12

**Figure 12-44a: High Channel Mask
Cellular EVDO mode**

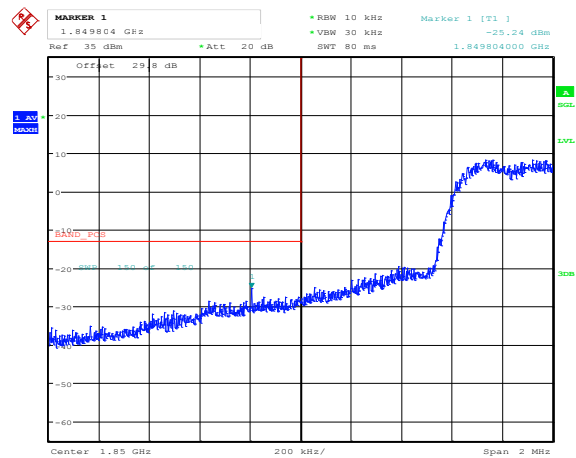


Date: 19.OCT.2015 11:20:22

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10A	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

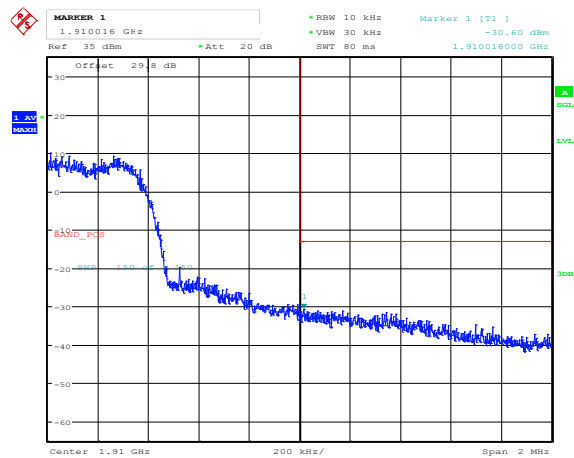
CDMA Conducted RF Emission Test Data cont'd

Figure 12-45a: Low Channel Mask
PCS EVDO mode



Date: 21.OCT.2015 11:34:53

Figure 12-46a: High Channel Mask
PCS EVDO mode

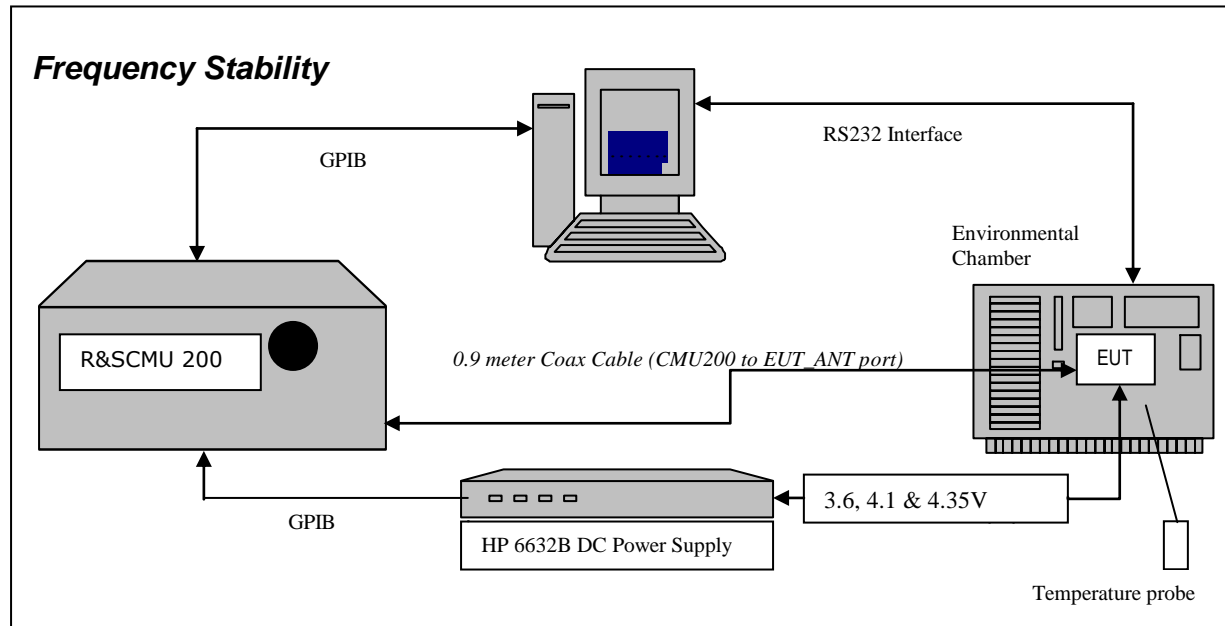


Date: 21.OCT.2015 11:35:49

APPENDIX 10B – CDMA FREQUENCY STABILITY TEST DATA

BlackBerry	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA Frequency Stability Test Data



The following measurements were performed by Landon Martin.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements

2.1055 Frequency Stability - Procedures

(a,b) Frequency Stability - Temperature Variation


(d) Frequency Stability - Voltage Variation

24.235 Frequency Stability.

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

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 24.235, CFR 47 chapter 1, Section 22.917 RSS-132, 4.3 Frequency Stability, and RSS-133, 6.3 Frequency Stability.

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

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Test Setup:

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


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

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

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

The EUT output power and frequency was measured at 3.6 volts, 4.1 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 824.70, 836.52, and 848.31 MHz for the cellular band and 1851.20, 1880.00 and 1908.75 MHz for the PCS band. This frequency was recorded in MHz and deviation from nominal, in Parts per Million.

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

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

Procedure:


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

85. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
86. Start test program
87. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
88. Set power supply voltage to 3.6 volts.
89. Set up CMU 200 Radio Communication Tester.
90. Command the CMU 200 to switch to the low channel.
91. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
92. EUT is commanded to Transmit 100 Bursts.
93. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
94. The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
95. Repeat steps 5 to 10 changing the supply voltage to 3.6 Volts
96. Increase temperature by 10°C and soak for 1/2 hour.
97. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
98. Repeat steps 5 to 10 changing the supply voltage to 4.1 volts
99. 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 following configurations were measured for model RHT181LW(STV100-2):

The maximum frequency error in the CDMA Cellular measured was **0.0191 PPM**.
The maximum frequency error in the CDMA PCS measured was **-0.0113 PPM**.

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


Date of test: October 20, 2015

CDMA Cellular Channel results: channels 1013, 384 and 777 @ 20°C maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	3.6	20	11.00	0.0133
384	836.52	3.6	20	10.00	0.0120
777	848.31	3.6	20	13.00	0.0153


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	3.8	20	10.00	0.0121
384	836.52	3.8	20	-11.00	-0.0131
777	848.31	3.8	20	12.00	0.0141

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	4.35	20	9.00	0.0109
384	836.52	4.35	20	14.00	0.0167
777	848.31	4.35	20	10.00	0.0118

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


CDMA Cellular Results:: channel 1013 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	3.6	-30	-14.00	-0.0170
1013	824.70	3.6	-20	6.00	0.0073
1013	824.70	3.6	-10	12.00	0.0146
1013	824.70	3.6	0	15.00	0.0182
1013	824.70	3.6	10	13.00	0.0158
1013	824.70	3.6	20	11.00	0.0133
1013	824.70	3.6	30	-7.00	-0.0085
1013	824.70	3.6	40	-9.00	-0.0109
1013	824.70	3.6	50	-12.00	-0.0146
1013	824.70	3.6	60	-11.00	-0.0133
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	3.8	-30	-9.00	-0.0109
1013	824.70	3.8	-20	7.00	0.0085
1013	824.70	3.8	-10	13.00	0.0158
1013	824.70	3.8	0	12.00	0.0146
1013	824.70	3.8	10	13.00	0.0158
1013	824.70	3.8	20	10.00	0.0121
1013	824.70	3.8	30	-8.00	-0.0097
1013	824.70	3.8	40	-10.00	-0.0121
1013	824.70	3.8	50	-10.00	-0.0121
1013	824.70	3.8	60	-10.00	-0.0121
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1013	824.70	4.35	-30	-10.00	-0.0121
1013	824.70	4.35	-20	6.00	0.0073
1013	824.70	4.35	-10	12.00	0.0146
1013	824.70	4.35	0	13.00	0.0158
1013	824.70	4.35	10	11.00	0.0133
1013	824.70	4.35	20	9.00	0.0109
1013	824.70	4.35	30	-8.00	-0.0097
1013	824.70	4.35	40	-11.00	-0.0133
1013	824.70	4.35	50	-11.00	-0.0133
1013	824.70	4.35	60	-12.00	-0.0146

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


CDMA Cellular Results: channel 384 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.52	3.6	-30	-14.00	-0.0167
384	836.52	3.6	-20	-5.00	-0.0060
384	836.52	3.6	-10	6.00	0.0072
384	836.52	3.6	0	7.00	0.0084
384	836.52	3.6	10	16.00	0.0191
384	836.52	3.6	20	10.00	0.0120
384	836.52	3.6	30	-11.00	-0.0131
384	836.52	3.6	40	-11.00	-0.0131
384	836.52	3.6	50	-13.00	-0.0155
384	836.52	3.6	60	-13.00	-0.0155
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.52	3.8	-30	-13.00	-0.0155
384	836.52	3.8	-20	-10.00	-0.0120
384	836.52	3.8	-10	14.00	0.0167
384	836.52	3.8	0	12.00	0.0143
384	836.52	3.8	10	12.00	0.0143
384	836.52	3.8	20	-11.00	-0.0131
384	836.52	3.8	30	-11.00	-0.0131
384	836.52	3.8	40	-11.00	-0.0131
384	836.52	3.8	50	-11.00	-0.0131
384	836.52	3.8	60	-12.00	-0.0143
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
384	836.52	4.35	-30	-13.00	-0.0155
384	836.52	4.35	-20	9.00	0.0108
384	836.52	4.35	-10	10.00	0.0120
384	836.52	4.35	0	6.00	0.0072
384	836.52	4.35	10	14.00	0.0167
384	836.52	4.35	20	14.00	0.0167
384	836.52	4.35	30	-11.00	-0.0131
384	836.52	4.35	40	-12.00	-0.0143
384	836.52	4.35	50	-13.00	-0.0155
384	836.52	4.35	60	-13.00	-0.0155

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA Cellular Results: channel 777 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.31	3.6	-30	-11.00	-0.0130
777	848.31	3.6	-20	9.00	0.0106
777	848.31	3.6	-10	14.00	0.0165
777	848.31	3.6	0	13.00	0.0153
777	848.31	3.6	10	14.00	0.0165
777	848.31	3.6	20	13.00	0.0153
777	848.31	3.6	30	-10.00	-0.0118
777	848.31	3.6	40	-11.00	-0.0130
777	848.31	3.6	50	-13.00	-0.0153
777	848.31	3.6	60	-14.00	-0.0165
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.31	3.8	-30	8.00	0.0094
777	848.31	3.8	-20	10.00	0.0118
777	848.31	3.8	-10	14.00	0.0165
777	848.31	3.8	0	13.00	0.0153
777	848.31	3.8	10	13.00	0.0153
777	848.31	3.8	20	12.00	0.0141
777	848.31	3.8	30	-12.00	-0.0141
777	848.31	3.8	40	-11.00	-0.0130
777	848.31	3.8	50	-11.00	-0.0130
777	848.31	3.8	60	-12.00	-0.0141
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
777	848.31	4.35	-30	-10.00	-0.0118
777	848.31	4.35	-20	5.00	0.0059
777	848.31	4.35	-10	13.00	0.0153
777	848.31	4.35	0	14.00	0.0165
777	848.31	4.35	10	14.00	0.0165
777	848.31	4.35	20	10.00	0.0118
777	848.31	4.35	30	9.00	0.0106
777	848.31	4.35	40	-11.00	-0.0130
777	848.31	4.35	50	-11.00	-0.0130
777	848.31	4.35	60	-12.00	-0.0141


	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA PCS Channel results: channels 25, 600, & 1175 @ 20°C maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.6	20	11.00	0.0059
600	1880.00	3.6	20	12.00	0.0064
1175	1908.75	3.6	20	12.00	0.0063


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	20	10.00	0.0054
600	1880.00	3.8	20	11.00	0.0059
1175	1908.75	3.8	20	15.00	0.0079

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.35	20	-11.00	-0.0059
600	1880.00	4.35	20	11.00	0.0059
1175	1908.75	4.35	20	13.00	0.0068

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW


CDMA PCS Results: channel 25 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.6	-30	-16.00	-0.0086
25	1851.20	3.6	-20	-12.00	-0.0065
25	1851.20	3.6	-10	13.00	0.0070
25	1851.20	3.6	0	14.00	0.0076
25	1851.20	3.6	10	16.00	0.0086
25	1851.20	3.6	20	11.00	0.0059
25	1851.20	3.6	30	-16.00	-0.0086
25	1851.20	3.6	40	-14.00	-0.0076
25	1851.20	3.6	50	-16.00	-0.0086
25	1851.20	3.6	-30	-20.00	-0.0108
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	3.8	-30	-18.00	-0.0097
25	1851.20	3.8	-20	-10.00	-0.0054
25	1851.20	3.8	-10	16.00	0.0086
25	1851.20	3.8	0	15.00	0.0081
25	1851.20	3.8	10	16.00	0.0086
25	1851.20	3.8	20	10.00	0.0054
25	1851.20	3.8	30	-12.00	-0.0065
25	1851.20	3.8	40	-17.00	-0.0092
25	1851.20	3.8	50	-17.00	-0.0092
25	1851.20	3.8	60	-21.00	-0.0113
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
25	1851.20	4.35	-30	-18.00	-0.0097
25	1851.20	4.35	-20	-13.00	-0.0070
25	1851.20	4.35	-10	16.00	0.0086
25	1851.20	4.35	0	16.00	0.0086
25	1851.20	4.35	10	20.00	0.0108
25	1851.20	4.35	20	-11.00	-0.0059
25	1851.20	4.35	30	-13.00	-0.0070
25	1851.20	4.35	40	-17.00	-0.0092
25	1851.20	4.35	50	-21.00	-0.0113
25	1851.20	4.35	60	-18.00	-0.0097

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA PCS Results: channel 600 @ maximum transmitted power


Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.6	-30	-19.00	-0.0101
600	1880.00	3.6	-20	-12.00	-0.0064
600	1880.00	3.6	-10	15.00	0.0080
600	1880.00	3.6	0	18.00	0.0096
600	1880.00	3.6	10	12.00	0.0064
600	1880.00	3.6	20	12.00	0.0064
600	1880.00	3.6	30	-16.00	-0.0085
600	1880.00	3.6	40	-13.00	-0.0069
600	1880.00	3.6	50	-17.00	-0.0090
600	1880.00	3.6	60	-17.00	-0.0090
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	3.8	-30	-15.00	-0.0080
600	1880.00	3.8	-20	12.00	0.0064
600	1880.00	3.8	-10	13.00	0.0069
600	1880.00	3.8	0	14.00	0.0074
600	1880.00	3.8	10	18.00	0.0096
600	1880.00	3.8	20	11.00	0.0059
600	1880.00	3.8	30	-11.00	-0.0059
600	1880.00	3.8	40	-16.00	-0.0085
600	1880.00	3.8	50	-20.00	-0.0106
600	1880.00	3.8	60	-20.00	-0.0106
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
600	1880.00	4.35	-30	-17.00	-0.0090
600	1880.00	4.35	-20	14.00	0.0074
600	1880.00	4.35	-10	16.00	0.0085
600	1880.00	4.35	0	18.00	0.0096
600	1880.00	4.35	10	15.00	0.0080
600	1880.00	4.35	20	11.00	0.0059
600	1880.00	4.35	30	-11.00	-0.0059
600	1880.00	4.35	40	-17.00	-0.0090
600	1880.00	4.35	50	-15.00	-0.0080
600	1880.00	4.35	60	-16.00	-0.0085

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10B	
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW

CDMA PCS Results: channel 1175 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.6	-30	-14.00	-0.0073
1175	1908.75	3.6	-20	17.00	0.0089
1175	1908.75	3.6	-10	14.00	0.0073
1175	1908.75	3.6	0	19.00	0.0100
1175	1908.75	3.6	10	19.00	0.0100
1175	1908.75	3.6	20	12.00	0.0063
1175	1908.75	3.6	30	10.00	0.0052
1175	1908.75	3.6	40	-13.00	-0.0068
1175	1908.75	3.6	50	-14.00	-0.0073
1175	1908.75	3.6	60	-15.00	-0.0079
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	3.8	-30	-15.00	-0.0079
1175	1908.75	3.8	-20	14.00	0.0073
1175	1908.75	3.8	-10	15.00	0.0079
1175	1908.75	3.8	0	23.00	0.0120
1175	1908.75	3.8	10	19.00	0.0100
1175	1908.75	3.8	20	15.00	0.0079
1175	1908.75	3.8	30	-10.00	-0.0052
1175	1908.75	3.8	40	-14.00	-0.0073
1175	1908.75	3.8	50	-18.00	-0.0094
1175	1908.75	3.8	60	-12.00	-0.0063
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
1175	1908.75	4.35	-30	-14.00	-0.0073
1175	1908.75	4.35	-20	15.00	0.0079
1175	1908.75	4.35	-10	19.00	0.0100
1175	1908.75	4.35	0	20.00	0.0105
1175	1908.75	4.35	10	20.00	0.0105
1175	1908.75	4.35	20	13.00	0.0068
1175	1908.75	4.35	30	-10.00	-0.0052
1175	1908.75	4.35	40	-11.00	-0.0058
1175	1908.75	4.35	50	-13.00	-0.0068
1175	1908.75	4.35	60	-15.00	-0.0079

APPENDIX 10C – CDMA RADIATED EMISSIONS TEST DATA

	EMC Test Report for the BlackBerry® smartphone Model RHK211LW (STV100-1), RHM181LW (STV100-4), RHT181LW(STV100-2) APPENDIX 10C		
Test Report No.: RTS-6066-1510-13C	Dates of Test: July 21 to October 26, 2015	FCC ID: L6ARHK210LW, L6ARHM180LW, L6ARHT180LW IC: 2503A-RHK210LW	

Radiated Emissions Test Data Results cont'd

Date of Test: October 26, 2015

The following measurements were performed by Savtej Sandhu.

The environmental tests conditions were: Temperature: 24.9 °C
Relative Humidity: 25.7 %

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

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

CDMA PCS Loopback Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator)		Limit (dBm)	Diff. To Limit (dB)
										(dBm)	(W)		
F0	25	1851.25	PCS	Horn	V	-36.07	-26.30	V-V	-14.78	26.00	0.40	33.00	7.00
F0	25	1851.25	PCS	Horn	H	-26.30		H-H	-13.62				
F0	600	1880.00	PCS	Horn	V	-32.82	-24.92	V-V	-12.70	27.62	0.58	33.00	5.38
F0	600	1880.00	PCS	Horn	H	-24.92		H-H	-11.78				
F0	1175	1908.75	PCS	Horn	V	-32.55	-24.79	V-V	-11.88	27.76	0.60	33.00	5.24
F0	1175	1908.75	PCS	Horn	H	-24.79		H-H	-11.65				

CDMA PCS EVDO Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method					
								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	25	1851.25	PCS	Horn	V	-39.72	-27.18	V-V	-15.61	25.18	0.33	33.00	7.82
F0	25	1851.25	PCS	Horn	H	-27.18		H-H	-14.44				
F0	600	1880.00	PCS	Horn	V	-37.82	-26.30	V-V	-14.07	26.23	0.42	33.00	6.77
F0	600	1880.00	PCS	Horn	H	-26.30		H-H	-13.17				
F0	1175	1908.75	PCS	Horn	V	-36.99	-26.07	V-V	-13.17	26.47	0.44	33.00	6.53
F0	1175	1908.75	PCS	Horn	H	-26.07		H-H	-12.94				

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