

# EMC Test Report

Tested in accordance with  
Federal Communications Commission (FCC)  
Personal Communications Services  
CFR 47, Part 15 Subpart C and E



**REPORT NO.:** RTS-6058-1408-08

**PRODUCT MODEL NO.:** RHB121LW  
**TYPE NAME:** BlackBerry® smartphone  
**FCC ID:** L6ARHB120LW

**DATE:** August 11, 2014

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



**592**

|                                             |                                                               |                            |
|---------------------------------------------|---------------------------------------------------------------|----------------------------|
| <b>BlackBerry</b>                           | EMC Test Report for the BlackBerry® smartphone Model RHB121LW |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08 | <b>Dates of Test:</b><br>July 7 – August 5, 2014              | <b>FCC ID:</b> L6ARHB120LW |

### **Statement of Performance:**

The BlackBerry® smartphone, model RHB121LW, part number CER-59877-001-Rev2-905-01, and its accessories perform within the requirements of the test standards when configured and operated under BlackBerry's operation instructions.

### **Declaration:**

We hereby certify that:

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

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

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

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

Documented by:



Rex Zhang  
Compliance Specialist Student

Reviewed by:



Savtej S. Sandhu  
Compliance Specialist I

Reviewed and Approved by:



Masud S. Attayi, P.Eng.  
Manager, Regulatory Compliance

|                                                                                   |                                                               |                            |
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## A. Scope

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

- o FCC CFR 47 Part 15, Subpart C, October, 2013
- o FCC CFR 47 Part 15, Subpart E, October, 2013
- o KDB 789033 D02 General UNII Test Procedures
- o KDB 905462 D06 802.11 Channel Plans

## B. Associated Documents

- 1) MultiSourceDeclaration\_R139-R140\_10.3.0.890\_Reg\_only
- 2) RHB121LW-R140-HWD\_CER-59877-001- Rev1-905-00
- 3) RHB121LW-R140-HWD\_CER-59877-001- Rev2-905-01
- 4) Test Report RTS-6058-1408-07
- 5) Test Report RTS-6026-1302-22

|                                                                                                      |                                                               |                            |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------|
|  <b>BlackBerry®</b> | EMC Test Report for the BlackBerry® smartphone Model RHB121LW |                            |
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### C. Product Identification

Manufactured by BlackBerry Limited whose headquarters is located at:  
 2200 University Ave. E  
 Waterloo, Ontario  
 Canada, N2K 0A7  
 Phone: 519 888 7465  
 Fax: 519 888 7884

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

BlackBerry RTS EMC test facilities

305 Phillip Street

Waterloo, Ontario

Canada, N2L 3W8

Phone: 519 888 7465

Fax: 519 888 6906

440 Phillip Street

Waterloo, Ontario

Canada, N2L 5R9

Phone: 519 888 7465

Fax: 519 888 6906

The testing was performed from July 7 – August 5, 2014.

|                                                                                   |                                                               |                            |
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| SAMPLE | MODEL    | CER NUMBER                | PIN      | SOFTWARE                              |
|--------|----------|---------------------------|----------|---------------------------------------|
| 1      | RHB121LW | CER-59877-001-Rev1-905-00 | 2FFEB308 | OS Version: 10.3.0.686<br>Bundle: 686 |
| 2      | RHB121LW | CER-59877-001-Rev2-905-01 | 2FFEC316 | OS Version: 10.3.0.890<br>Bundle: 890 |
| 3      | RHB121LW | CER-59877-001-Rev1-905-00 | 2FFEB310 | OS Version: 10.3.0.686<br>Bundle: 686 |
| 4      | RHB121LW | CER-59877-001-Rev2-905-01 | 2FFEC31A | OS Version: 10.3.0.890<br>Bundle: 890 |
| 5      | RHB121LW | CER-59877-001-Rev1-905-00 | 2FFEB2F0 | OS Version: 10.3.0.686<br>Bundle: 686 |

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

Only the characteristics that may have been affected by the changes from RHB121LW Rev1 to Rev2 were re-tested. For more details, please view documents RHB121LW-R140-HWD\_CER-59877-001-Rev1-905-00 and RHB121LW-R140-HWD\_CER-59877-001-Rev2-905-01.

To view the differences between software bundles 10.3.0.686 and 10.3.0.890 for RHB121LW, see document: MultiSourceDeclaration\_R139-R140\_10.3.0.890\_Reg\_only.

#### D. Support Equipment Used for the Testing of the EUT

- 1) Lenovo Thinkpad laptop, type 4236-D84, S/N PB-HX502 12/02, product ID 4236D84

|                                                                                   |                                                               |                            |
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## E. Test Results Chart

| SPECIFICATION              | TEST TYPE                                          | Meets Requirements | TEST DATA                        |
|----------------------------|----------------------------------------------------|--------------------|----------------------------------|
| FCC CFR 47                 |                                                    |                    | APPENDIX                         |
| Part 15.207                | AC Powerline Conducted Emission                    | Pass               | See Test Report RTS-6058-1408-07 |
| Part 15.209<br>Part 15.247 | BT/BLE Radiated Spurious Emissions                 | Pass               | 1                                |
| Part 15.209<br>Part 15.247 | BT/BLE Radiated Band Edge Compliance               | Pass               | 1                                |
| Part 15.209<br>Part 15.247 | 802.11b/g/n Radiated Spurious Emissions            | Pass               | 1                                |
| Part 15.209<br>Part 15.247 | 802.11b/g/n Radiated Band Edge Compliance          | Pass               | 1                                |
| Part 15.209<br>Part 15.407 | 802.11a/n Radiated Spurious Emissions              | Pass               | See Test Report RTS-6058-1408-07 |
| Part 15.209<br>Part 15.407 | 802.11a/n Radiated Band Edge Compliance            | Pass               | See Test Report RTS-6058-1408-07 |
| Part 15.247(a)             | BT, 20 dB Bandwidth                                | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(a)             | BT, Carrier Frequency Separation                   | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(a)             | BT, Number of Hopping Frequencies                  | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(a)             | BT, Time of Occupancy (Dwell Time)                 | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(b)             | BT, Maximum Peak Conducted Output Power            | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(c)             | BT, Band-Edge Compliance of RF Conducted Emissions | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(c)             | BT, Spurious RF Conducted Emissions                | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(a)             | BLE, 6 dB Bandwidth                                | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(b)             | BLE, Maximum Conducted Output Power                | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(c)             | BLE, Band-Edge                                     | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(d)             | BLE, Peak Power Spectral Density                   | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(c)             | BLE, Spurious RF Conducted Emissions               | Pass               | See Test Report RTS-6026-1302-22 |

|                                                                                   |                                                               |                            |
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### Test Results Chart cont'd

| SPECIFICATION                 | TEST TYPE                                      | Meets Requirements | TEST DATA                        |
|-------------------------------|------------------------------------------------|--------------------|----------------------------------|
| FCC CFR 47                    |                                                |                    | APPENDIX                         |
| Part 15.247(a)                | 802.11b/g/n, 6 dB Bandwidth                    | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(b)                | 802.11b/g/n, Maximum Conducted Output Power    | Pass               | 2                                |
| Part 15.247(c)                | 802.11b/g/n, Band-Edge                         | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(d)                | 802.11b/g/n, Peak Power Spectral Density       | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.247(c)                | 802.11b/g/n, Spurious RF Conducted Emissions   | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.407                   | 802.11a/n, 6 dB Bandwidth                      | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.407                   | 802.11a/n, Maximum Conducted Output Power      | Pass               | 3                                |
| Part 15.407                   | 802.11a/n, Band-Edge                           | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.407                   | 802.11a/n, Peak Power Spectral Density         | Pass               | 3                                |
| Part 15.407                   | 802.11a/n, Spurious RF Conducted Emissions     | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.209<br>Part 15.225(a) | Near Field Communications, Radiated Emissions  | Pass               | See Test Report RTS-6058-1408-07 |
| Part 15.225(e)                | Near Field Communications, Occupied Bandwidth  | Pass               | See Test Report RTS-6026-1302-22 |
| Part 15.225(e)                | Near Field Communications, Frequency Stability | Pass               | See Test Report RTS-6026-1302-22 |

|                                                                                   |                                                               |                            |
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## F. Summary of Results

### 1) BLUETOOTH, BLUETOOTH LOW ENERGY AND 802.11b/g/n RADIATED EMISSIONS

#### a) Radiated Spurious and Harmonic Emissions

The EUT was placed on a nonconductive styrofoam table, 80 cm high that was positioned on a remotely controlled turntable. The test distance used between the EUT and the receiving antenna was three metres. The turntable was rotated to determine the azimuth of the peak emissions. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The maximum emission level was recorded. The frequency range measured was from 30 MHz to 25.0 GHz. Both the horizontal and vertical polarizations of the emissions were measured.

The measurements were done in a semi-anechoic chamber (SAC) below 1 GHz and a modified semi-anechoic chamber (modified SAC) with floor absorbers above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The modified SAC's FCC registration number is **959115** and the IC file number is **2503C-1**.

The EUT was configured and operated to produce the maximum radiated emissions while still keeping within BlackBerry's specifications.

The BlackBerry® smartphone was measured in standalone configuration with Bluetooth transmitting in single frequency mode at low channel (0), middle channel (39) and high channel (78) for packet type "DH5", "2-DH5" and "3-DH5". The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart C, 15.247 .

The BlackBerry® smartphone was measured in standalone configuration with Bluetooth Low Energy transmitting in single frequency mode at low channel (0), middle channel (20) and high channel (39). The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15, Subpart C, 15.247 .

The BlackBerry® smartphone was measured in standalone configuration transmitting on channels 1, 6 & 11 at 1 Mbps for 802.11b mode, at 6 Mbps for 802.11g mode, and at MCS 0 for 802.11n mode. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.247 .

The Bluetooth harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).

|                                                                                   |                                                               |                            |
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The Bluetooth Low Energy harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).  
The 802.11b/g/n harmonics were investigated up to the 10th harmonic. The sample EUT emissions were in the noise floor (NF).  
See APPENDIX 2 for the test data.

b) Band-Edge Compliance of RF Radiated Emissions

The BlackBerry® smartphone met the requirements for band-edge compliance of RF radiated emissions for Bluetooth, Bluetooth Low Energy and 802.11b/g/n as per the requirements of 15.247, 15.209.

**Measurement Uncertainty  $\pm 4.2$  dB**

See APPENDIX 1 for the test data

|                                                                                   |                                                               |                            |
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## 2) 802.11b/g/n RF CONDUCTED EMISSIONS

The 802.11b/g/n conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart C.

### a) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.247(b). Low channel (1), middle channel (6) and high channel (11) were measured. The worst case Conducted Output Power level was 19.78 dBm (95.06 mW) for channel 6 in 802.11b mode, 19.31 dBm (85.31 mW) for channel 6 in 802.11g mode, and 15.42 dBm (34.83 mW) for channel 6 in 802.11n mode. See APPENDIX 2 for the test data

## 3) 802.11a/n RF CONDUCTED EMISSIONS

The 802.11a/n conducted RF emissions from the BlackBerry® smartphone were measured using the methods outlined in FCC CFR 47 Part 15, Subpart E.

### a) Maximum Conducted Output Power

The EUT met the requirements of the maximum conducted output power as per 47 CFR 15.407. Channels 36, 48, 64, 100, 140 and 165 were measured. The worst case Conducted Output Power level was 14.33 dBm (27.10 mW) for channel 140 in 802.11a mode. The worst case Conducted Output Power level was 14.41 dBm (27.61 mW) for channel 140 in 802.11n mode. See APPENDIX 5 for the test data

### b) Peak Power Spectral Density

The EUT met the requirements of peak power spectral density as per 47 CFR 15.407. Channels 36, 64, 100, 140 and 165 were measured. See APPENDIX 3 for the test data.

|                                                                                   |                                                               |                            |
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## G. Compliance Test Equipment Used

| <u>UNIT</u>           | <u>MANUFACTURER</u> | <u>MODEL</u> | <u>SERIAL<br/>NUMBER</u> | <u>CAL DUE<br/>DATE</u><br>(YY MM DD) | <u>USE</u>                         |
|-----------------------|---------------------|--------------|--------------------------|---------------------------------------|------------------------------------|
| EMI Test Receiver     | Rohde & Schwarz     | ESIB 40      | 100255                   | 14-12-11                              | Conducted/Radiated Emissions       |
| EMI Test Receiver     | Rohde & Schwarz     | ESU 40       | 100162                   | 14-12-08                              | Conducted/Radiated Emissions       |
| Hybrid Log Antenna    | EMC Automation      | HLP-3003C    | 017301                   | 14-08-13                              | Radiated Emissions                 |
| Horn Antenna          | CMT                 | 3116         | R52734-001               | 16-03-31                              | Radiated Emissions                 |
| Horn Antenna          | EMCO                | 3116         | 2538                     | 14-10-30                              | Radiated Emissions                 |
| Horn Antenna          | ETS-Lindgren        | 3117         | 2538                     | 15-08-07                              | Radiated Emissions                 |
| Active Loop Antenna   | EMCO                | 6507         | 00032                    | 15-08-21                              | Radiated Emissions                 |
| Preamplifier          | Rohde & Schwarz     | TS-ANA4-SP   | 001                      | 14-10-13                              | Radiated Emissions                 |
| Preamplifier          | Sonoma              | 310N/11909A  | 185831                   | 14-10-10                              | Radiated Emissions                 |
| Preamplifier          | Rohde & Schwarz     | TS-ANA-SP    | 001                      | 14-10-13                              | Radiated Emissions                 |
| L.I.S.N.              | Rohde & Schwarz     | ENV216       | 100060                   | 15-10-08                              | Conducted Emissions                |
| Environment Monitor   | Omega               | iTHX-SD      | 0380561                  | 14-10-30                              | Radiated Emissions                 |
| EMC Analyzer          | Agilent             | E7405A       | US40240226               | 15-01-23                              | Radiated Emissions                 |
| DC Power Supply       | HP                  | 6632B        | US37472178               | 14-09-03                              | RF Conducted Emissions             |
| Environment Monitor   | Omega               | iTHX-SD      | 0340060                  | 16-09-11                              | RF Conducted Emissions             |
| Environmental Chamber | Test Equity         | 107          | 0900246                  | N/R                                   | Frequency Stability                |
| Bluetooth Tester      | Rohde & Schwarz     | CBT          | 119549                   | 14-11-28                              | RF Conducted Emissions             |
| Bluetooth Tester      | Rohde & Schwarz     | CBT35        | 100368                   | 14-11-28                              | Radiated Emissions                 |
| Bluetooth Tester      | Rohde & Schwarz     | CBT35        | 100370                   | 14-11-28                              | Radiated Emissions                 |
| Power Meter           | Agilent             | N1911A       | MY45100951               | 15-09-10                              | RF Conducted / Frequency Stability |
| Power Sensor          | Agilent             | N1921A       | MY45241383               | 15-09-11                              | RF Conducted / Frequency Stability |
| Environment Monitor   | Omega               | iTHX-SD      | 0380567                  | 14-10-30                              | Radiated Emissions                 |

**APPENDIX 1 – BLUETOOTH, BLUETOOTH LOW ENERGY AND 802.11b/g/n  
RADIATED EMISSIONS TEST DATA**

|                                                                                   |                                                                              |                            |
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Radiated Emissions Test Results  
Bluetooth Band

Date of Test: July 4, 2014

Measurements were performed by Rex Zhang.

The environmental test conditions were: Temperature: 25.1°C  
Relative Humidity: 48.6 %

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone in Bluetooth TX mode was in horizontal position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 39 and 78 using packet types “DH5”, “2-DH5” and “3-DH5”.

All emission levels were at least 25 dB below the limit.

|                                                                                   |                                                                              |                            |
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Radiated Emissions Test Results cont'd  
Bluetooth Band cont'd

Date of Test: July 14 - 15 and August 5, 2014  
Measurements were performed by Kevin Guo

The environmental test conditions were: Temperature: 23.4 – 24.5°C  
Relative Humidity: 33.9 – 44.3 %

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone in Bluetooth TX mode was in horizontal down position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 39 and 78 using packet types “DH5”, “2-DH5” and “3-DH5”.

All emission levels were at least 25 dB below the limit.

|                                                                                   |                                                                              |                     |
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Band-Edge Compliance of RF Radiated Emissions Test Results  
Bluetooth Band

Date of test: July 29, 2014

Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 25.5 ° C  
Relative Humidity: 32.7 %

The BlackBerry® smartphone was in standalone, Vertical Up position and pattern type “Static PBRs” in “DH5”, “2-DH5” and “3-DH5” modulation during the measurements.

The test distance was 3.0 meters.

| Channel                         | Freq.<br>(MHz) | Rx Antenna<br>Type | POL. | Detector | VBW   | Corrected<br>Reading<br>(dBuV/m) | Delta<br>Marker<br>(dB) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------------------------------|----------------|--------------------|------|----------|-------|----------------------------------|-------------------------|------------------------------------|-------------------|---------------------------|
| Low Channel, Packet Type DH5    |                |                    |      |          |       |                                  |                         |                                    |                   |                           |
| 0                               | 2402           | Horn               | V    | PK       | 1 MHz | 97.36                            | 55.72                   | 41.64                              | 74.00             | -32.36                    |
| 0                               | 2402           | Horn               | H    | PK       | 1 MHz | 98.60                            | 56.76                   | 41.84                              | 74.00             | -32.16                    |
| 0                               | 2402           | Horn               | V    | AVE.     | 10 Hz | 90.28                            | 55.72                   | 34.56                              | 54.00             | -19.44                    |
| 0                               | 2402           | Horn               | H    | AVE.     | 10 Hz | 91.57                            | 56.76                   | 34.81                              | 54.00             | -19.19                    |
| High Channel, Packet Type DH5   |                |                    |      |          |       |                                  |                         |                                    |                   |                           |
| 78                              | 2480           | Horn               | V    | PK       | 1 MHz | 100.07                           | 57.68                   | 42.39                              | 74.00             | -31.61                    |
| 78                              | 2480           | Horn               | H    | PK       | 1 MHz | 98.84                            | 56.82                   | 42.02                              | 74.00             | -31.98                    |
| 78                              | 2480           | Horn               | V    | AVE.     | 10 Hz | 93.05                            | 57.68                   | 35.37                              | 54.00             | -18.63                    |
| 78                              | 2480           | Horn               | H    | AVE.     | 10 Hz | 91.76                            | 56.82                   | 34.94                              | 54.00             | -19.06                    |
| Low Channel, Packet Type 2-DH5  |                |                    |      |          |       |                                  |                         |                                    |                   |                           |
| 0                               | 2402           | Horn               | V    | PK       | 1 MHz | 95.94                            | 52.95                   | 42.99                              | 74.00             | -31.01                    |
| 0                               | 2402           | Horn               | H    | PK       | 1 MHz | 97.41                            | 54.56                   | 42.85                              | 74.00             | -31.15                    |
| 0                               | 2402           | Horn               | V    | AVE.     | 10 Hz | 86.36                            | 52.95                   | 33.41                              | 54.00             | -20.59                    |
| 0                               | 2402           | Horn               | H    | AVE.     | 10 Hz | 87.80                            | 54.56                   | 33.24                              | 54.00             | -20.76                    |
| High Channel, Packet Type 2-DH5 |                |                    |      |          |       |                                  |                         |                                    |                   |                           |
| 78                              | 2480           | Horn               | V    | PK       | 1 MHz | 98.70                            | 55.41                   | 43.29                              | 74.00             | -30.71                    |
| 78                              | 2480           | Horn               | H    | PK       | 1 MHz | 97.45                            | 54.18                   | 43.27                              | 74.00             | -30.73                    |
| 78                              | 2480           | Horn               | V    | AVE.     | 10 Hz | 88.95                            | 55.41                   | 33.54                              | 54.00             | -20.46                    |
| 78                              | 2480           | Horn               | H    | AVE.     | 10 Hz | 87.74                            | 54.18                   | 33.56                              | 54.00             | -20.44                    |

|                                                                                   |                                                                              |                     |
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Band-Edge Compliance of RF Radiated Emissions Test Results cont'd  
Bluetooth Band

| Channel                         | Freq.<br>(MHz) | Rx Antenna |      | Detector | VBW   | Corrected<br>Reading<br>(dBuV/m) | Delta<br>Marker<br>(dB) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------------------------------|----------------|------------|------|----------|-------|----------------------------------|-------------------------|------------------------------------|-------------------|---------------------------|
|                                 |                | Type       | POL. |          |       |                                  |                         |                                    |                   |                           |
| Low Channel, Packet Type 3-DH5  |                |            |      |          |       |                                  |                         |                                    |                   |                           |
| 0                               | 2402           | Horn       | V    | PK       | 1 MHz | 96.27                            | 53.43                   | 42.84                              | 74.00             | -31.16                    |
| 0                               | 2402           | Horn       | H    | PK       | 1 MHz | 98.51                            | 55.13                   | 43.38                              | 74.00             | -30.62                    |
| 0                               | 2402           | Horn       | V    | AVE.     | 10 Hz | 86.34                            | 53.43                   | 32.91                              | 54.00             | -21.09                    |
| 0                               | 2402           | Horn       | H    | AVE.     | 10 Hz | 87.79                            | 55.13                   | 32.66                              | 54.00             | -21.34                    |
| High Channel, Packet Type 3-DH5 |                |            |      |          |       |                                  |                         |                                    |                   |                           |
| 78                              | 2480           | Horn       | V    | PK       | 1 MHz | 98.99                            | 54.66                   | 44.33                              | 74.00             | -29.67                    |
| 78                              | 2480           | Horn       | H    | PK       | 1 MHz | 97.69                            | 53.87                   | 43.82                              | 74.00             | -30.18                    |
| 78                              | 2480           | Horn       | V    | AVE.     | 10 Hz | 88.95                            | 54.66                   | 34.29                              | 54.00             | -19.71                    |
| 78                              | 2480           | Horn       | H    | AVE.     | 10 Hz | 87.62                            | 53.87                   | 33.75                              | 54.00             | -20.25                    |

See figures 1-1 to 1-12 for the plots of the Bluetooth band-edge compliance.



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## Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 1-1: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 0, Pol: V, Detector: PK

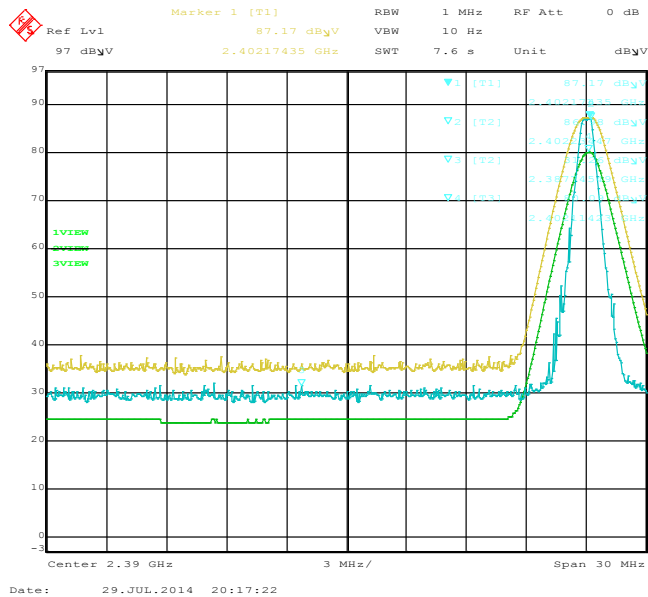


Figure 1-2: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 0, Pol: H, Detector: PK

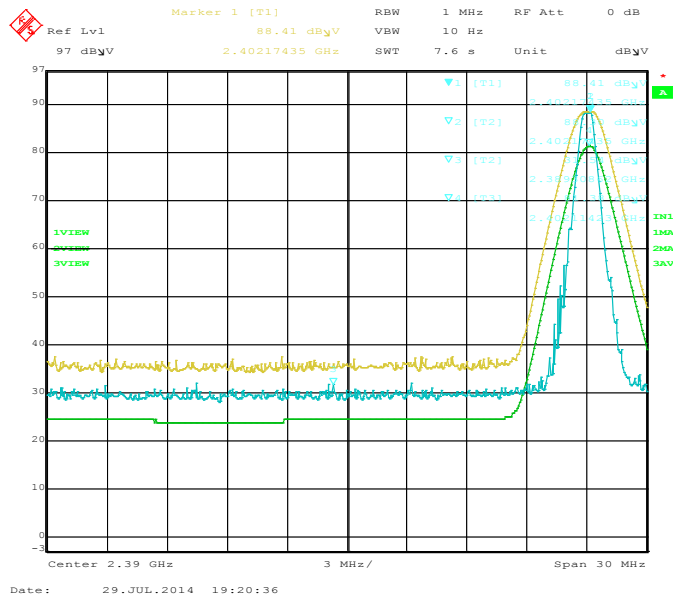


Figure 1-3: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 78, Pol: V, Detector: PK

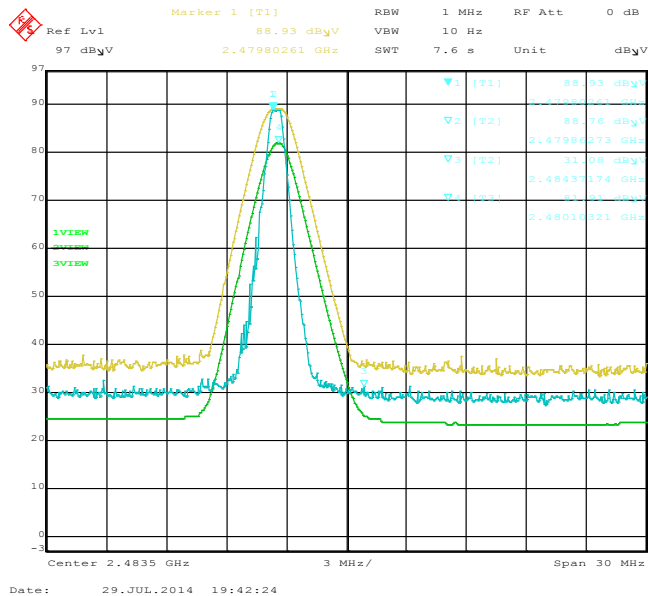
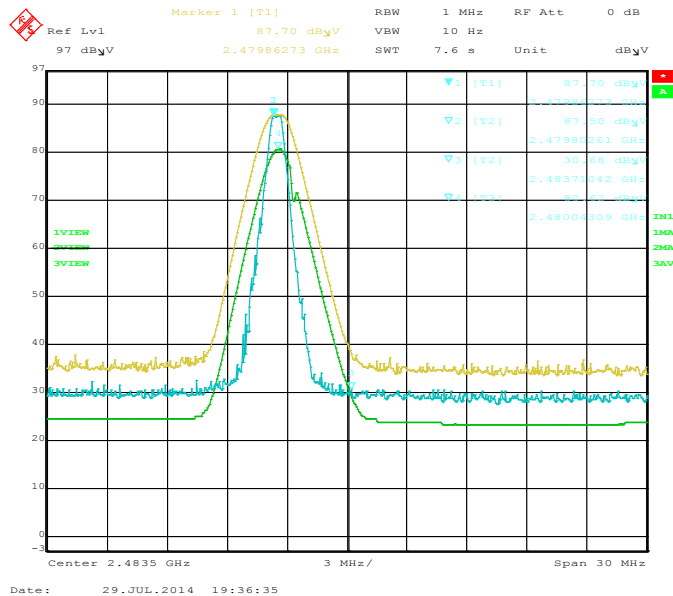
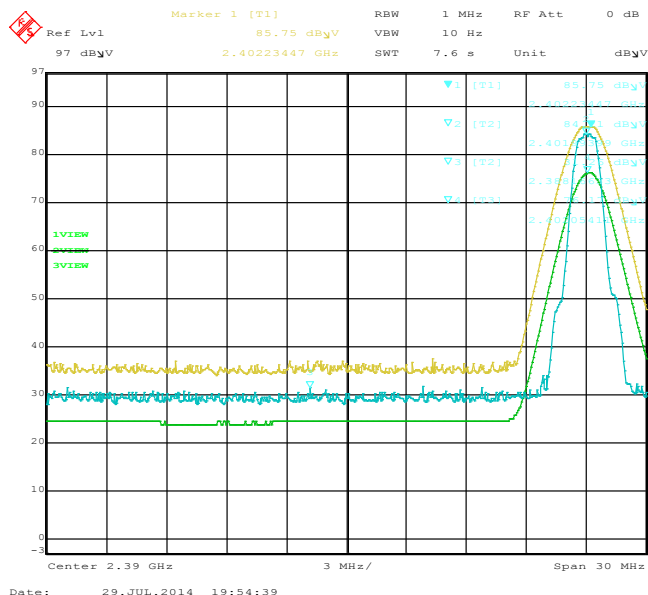


Figure 1-4: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth, Single freq., Static PBRs,  
DH5, Channel 78, Pol: H, Detector: PK

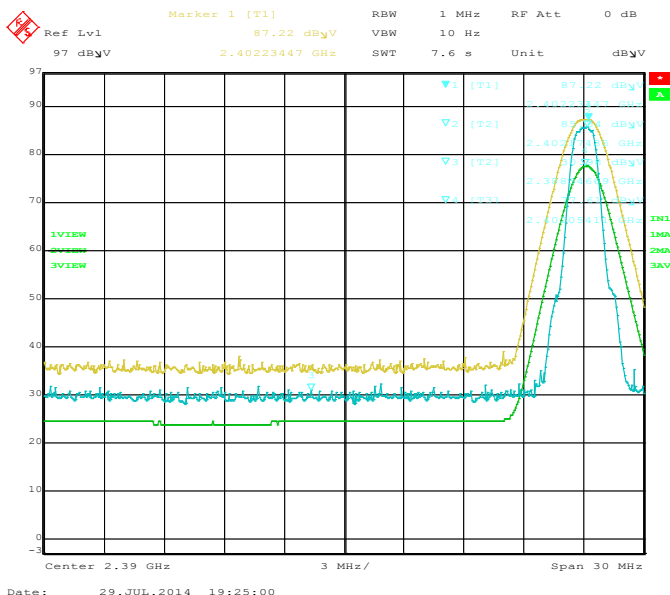


## Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

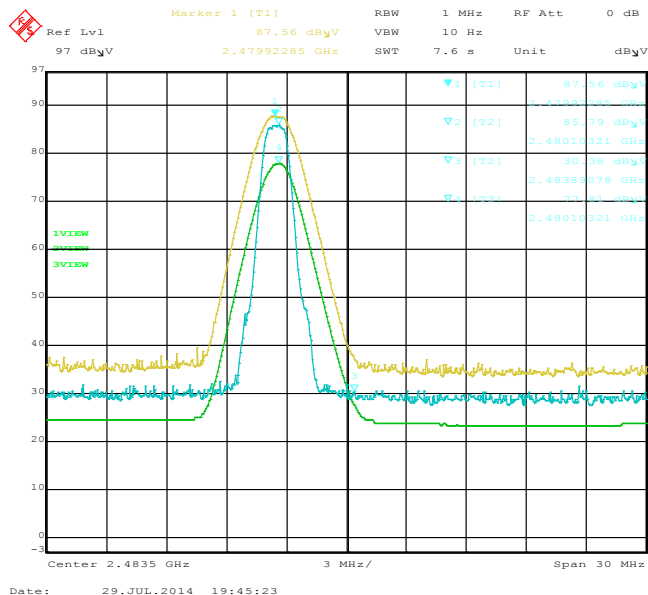
**Figure 1-5: Band-Edge Compliance of RF Rad. Emissions.**  
**Bluetooth, Single freq., Static PBRs,**  
**2-DH5, Channel 0, Pol: V, Detector: PK**



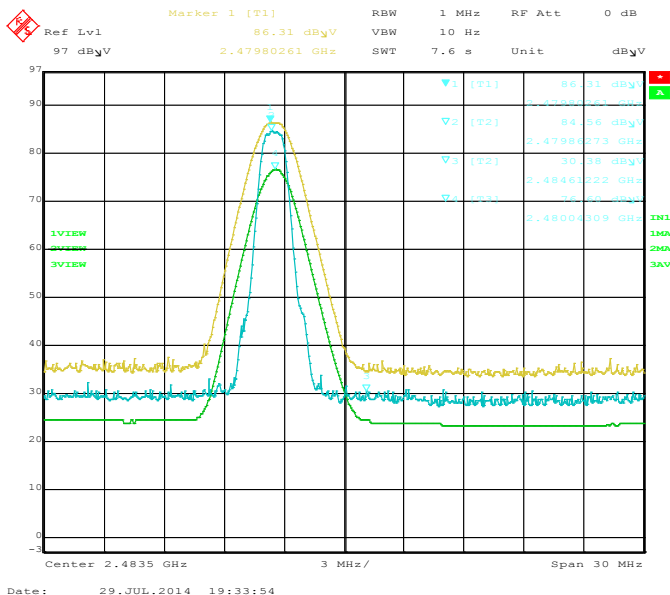
**Figure 1-6: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
2-DH5, Channel 0, Pol: H, Detector: PK



**Figure 1-7: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
2-DH5, Channel 78, Pol: V, Detector: PK



**Figure 1-8: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRS,  
2-DH5, Channel 78, Pol: H, Detector: PK





# EMC Test Report for the BlackBerry® smartphone RHB121LW

## APPENDIX 1

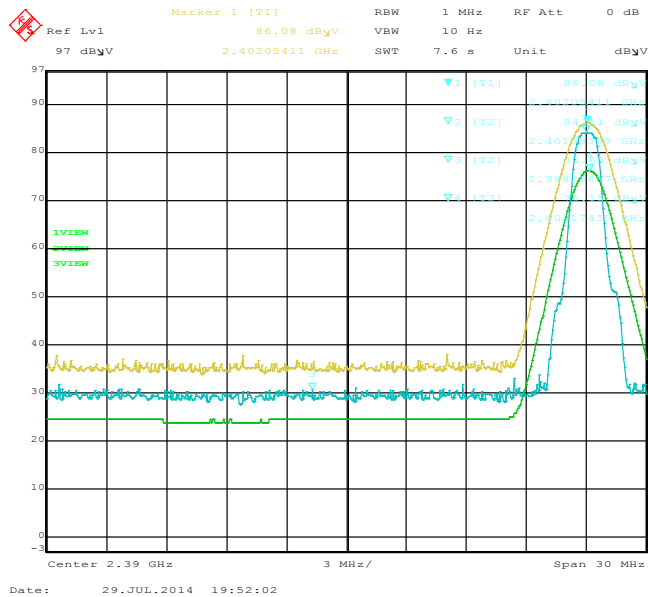
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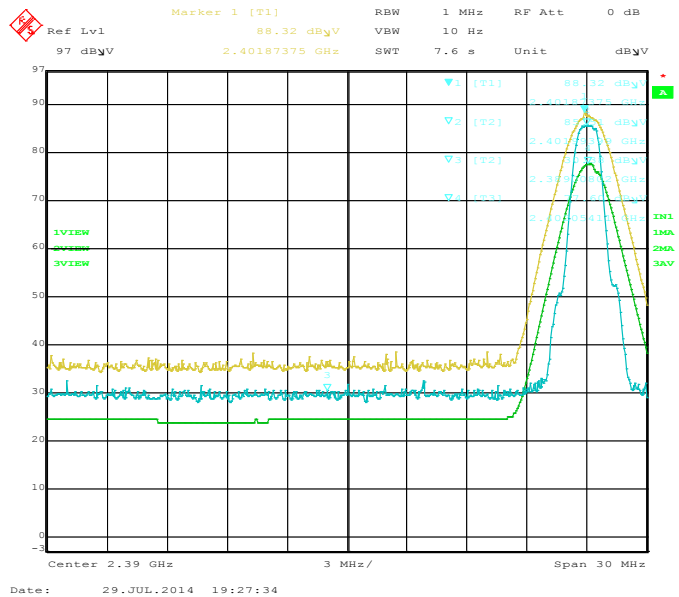
FCC ID: L6ARHB120LW

### Bluetooth Band-Edge Compliance of RF Radiated Emissions cont'd

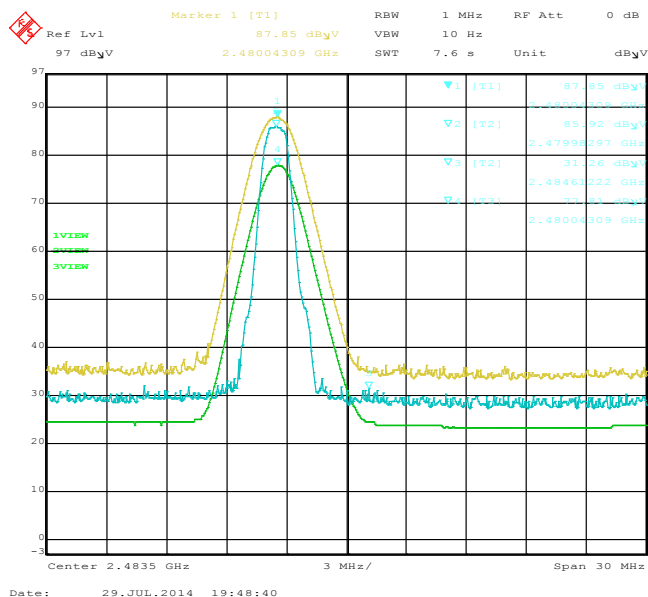
**Figure 1-9: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
3-DH5, Channel 0, Pol: V, Detector: PK



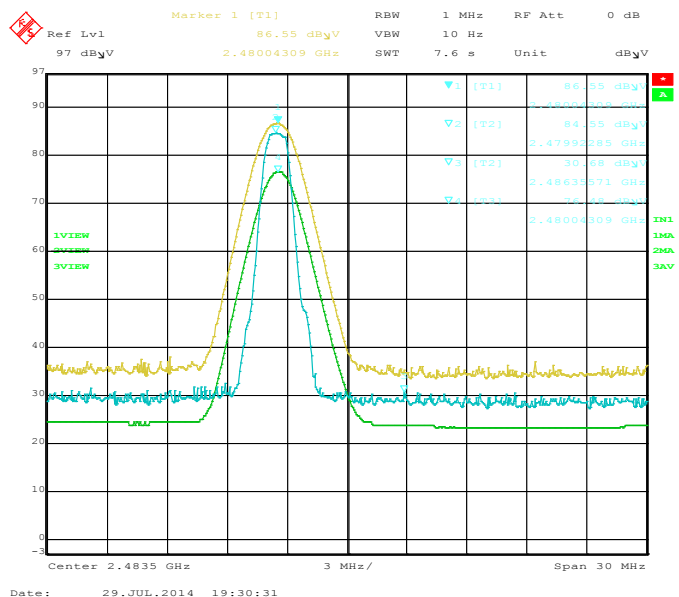
**Figure 1-10: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
3-DH5, Channel 0, Pol: H, Detector: PK



**Figure 1-11: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
3-DH5, Channel 78, Pol: V, Detector: PK



**Figure 1-12: Band-Edge Compliance of RF Rad. Emissions.**  
Bluetooth, Single freq., Static PBRs,  
3-DH5, Channel 78, Pol: H, Detector: PK



|                                                                                   |                                                                              |                            |
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Radiated Emissions Test Results cont'd  
Bluetooth Low Energy Band

Date of Test: July 7, 2014

Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 26.0 °C  
Relative Humidity: 47.4 %

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone in Bluetooth Low Energy TX mode was in horizontal position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 20 and 39.

All emissions had a test margin of greater than 25.0 dB.

Date of Test: July 14 - 15, 2014 and August 5, 2014

Measurements were performed by Masud Attayi.

The environmental test conditions were: Temperature: 23.4 – 24.5°C  
Relative Humidity: 38.9 – 42.7%

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone in Bluetooth Low Energy TX mode was in horizontal down position.

The frequency sweep measurements were performed in single frequency mode on channels 0, 20 and 39.

All other emission levels were at least 25 dB below the limit.

|                                                                                   |                                                                              |                     |
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|  | EMC Test Report for the BlackBerry® smartphone RHB121LW<br><b>APPENDIX 1</b> |                     |
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Band-Edge Compliance of RF Radiated Emissions Test Results  
Bluetooth Low Energy Band

Date of test: July 29, 2014

Measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 25.5° C  
Relative Humidity: 32.7 %

The BlackBerry® smartphone was in Vertical Up position.

The test distance was 3.0 meters.

| Channel          | Freq.<br>(MHz) | Rx Antenna |      | Detector | VBW   | Corrected<br>Reading<br>(dBuV/m) | Delta<br>Marker<br>(dB) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|------------------|----------------|------------|------|----------|-------|----------------------------------|-------------------------|------------------------------------|-------------------|---------------------------|
|                  |                | Type       | POL. |          |       |                                  |                         |                                    |                   |                           |
| Low Channel, LE  |                |            |      |          |       |                                  |                         |                                    |                   |                           |
| 0                | 2402           | Horn       | V    | PK       | 1 MHz | 95.25                            | 53.92                   | 41.33                              | 74.00             | -32.67                    |
| 0                | 2402           | Horn       | H    | PK       | 1 MHz | 96.38                            | 55.05                   | 41.33                              | 74.00             | -32.67                    |
| 0                | 2402           | Horn       | V    | AVE.     | 10 Hz | 90.39                            | 53.92                   | 36.47                              | 54.00             | -17.53                    |
| 0                | 2402           | Horn       | H    | AVE.     | 10 Hz | 91.53                            | 55.05                   | 36.48                              | 54.00             | -17.52                    |
| High Channel, LE |                |            |      |          |       |                                  |                         |                                    |                   |                           |
| 39               | 2480           | Horn       | V    | PK       | 1 MHz | 98.48                            | 55.70                   | 42.78                              | 74.00             | -31.22                    |
| 39               | 2480           | Horn       | H    | PK       | 1 MHz | 96.87                            | 54.64                   | 42.23                              | 74.00             | -31.77                    |
| 39               | 2480           | Horn       | V    | AVE.     | 10 Hz | 93.68                            | 55.70                   | 37.98                              | 54.00             | -16.02                    |
| 39               | 2480           | Horn       | H    | AVE.     | 10 Hz | 92.05                            | 54.64                   | 37.41                              | 54.00             | -16.59                    |

See figures 1-13 to 1-16 for the plots of the Bluetooth Low Energy band-edge compliance.



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## Bluetooth Low Energy Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 1-13: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth Low Energy, Single freq.,  
LE, Channel 0, Pol: V, Detector: PK

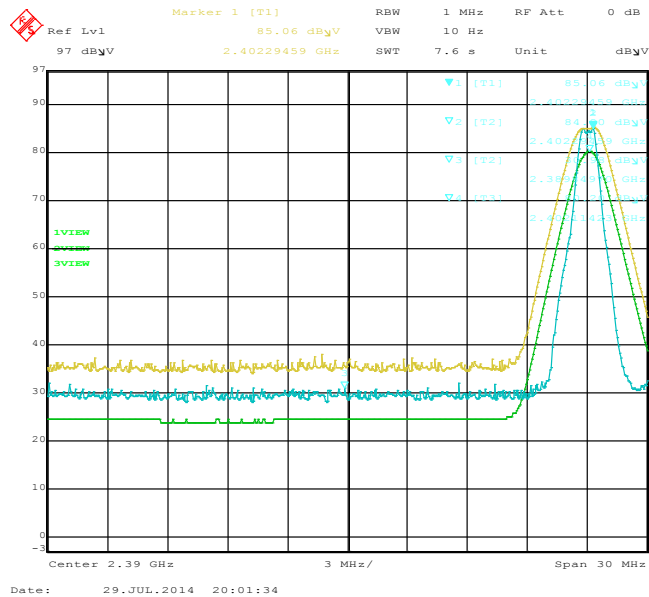


Figure 1-14: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth Low Energy, Single freq.,  
LE, Channel 0, Pol: H, Detector: PK

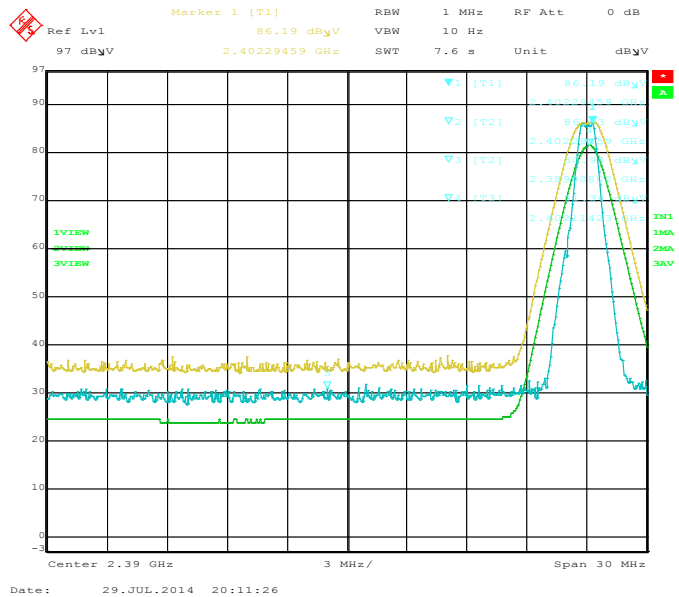


Figure 1-15: Band-Edge Compliance of RF Rad. Emissions.  
Bluetooth Low Energy, Single freq.,  
LE, Channel 39, Pol: V, Detector: PK

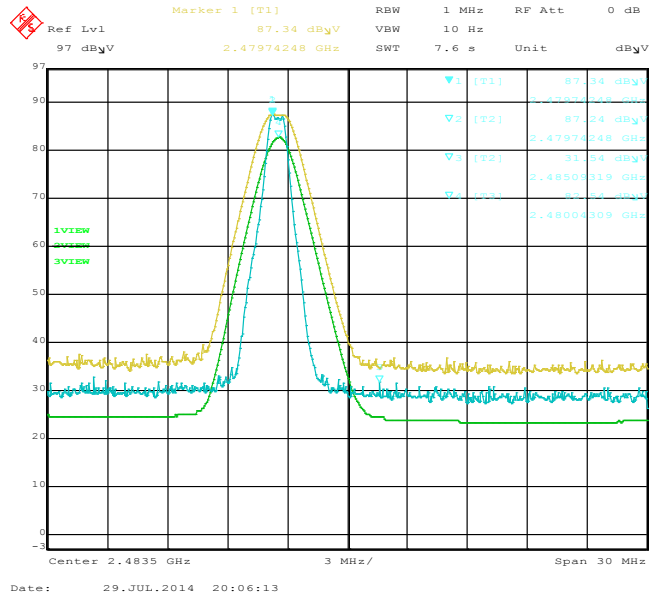
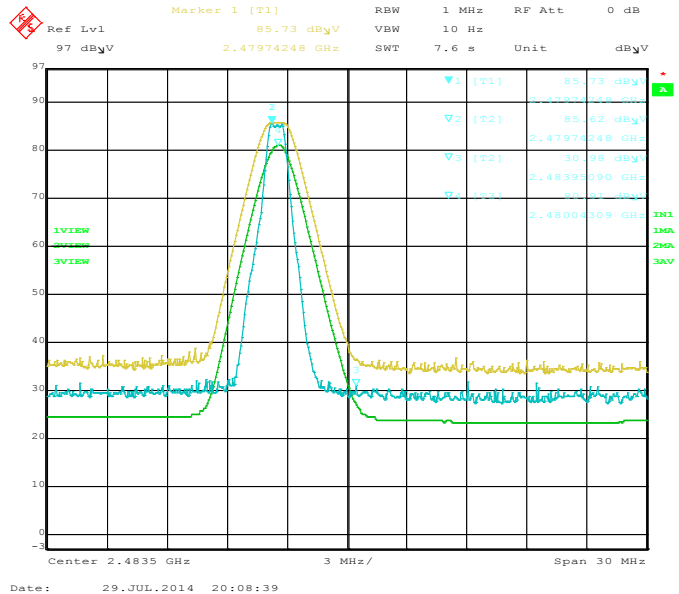


Figure 1-16: Band-Edge Compliance of RF Rad. Emissions  
Bluetooth Low Energy, Single freq.,  
LE, Channel 39, Pol: H, Detector: PK



|                                                                                   |                                                                              |                            |
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Radiated Emissions Test Results cont'd  
802.11b/g/n Band

Date of Test: July 25 – 28, 2014  
Measurements performed by Rex Zhang.

The environmental test conditions were: Temperature: 26.3 – 26.5°C  
Relative Humidity: 34.7 - 42.5%

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 30 MHz to 1 GHz.

The BlackBerry® smartphone was in Vertical Up position.

The frequency sweep measurements were performed in 802.11b TX mode at 1 Mbps on channels 1, 6 and 11, in 802.11g TX mode at 6 Mbps on channels 1, 6 and 11, and in 802.11n TX mode at MCS 0 on channels 1, 6 and 11.

All other emission levels were at least 25 dB below the limit.

Date of Test: July 22 - 28 and August 5, 2014  
Measurements performed by Kevin Guo.

The environmental test conditions were: Temperature: 23.4 – 24.5 °C  
Relative Humidity: 33.9 – 44.3 %

The test distance was 3.0 meters with a EUT height of 0.8 meters, and sweep frequency of 1GHz to 25GHz.

The BlackBerry® smartphone was in USB Down position.

The frequency sweep measurements were performed in 802.11b TX mode at 1 Mbps on channels 1, 6 and 11, in 802.11g TX mode at 6 Mbps on channels 1, 6 and 11, and in 802.11n TX mode at MCS 0 on channels 1, 6 and 11.

All emissions had a test margin of greater than 25.0 dB.

|                                                                                   |                                                                              |                     |
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### 802.11b/g/n Band-Edge Compliance of RF Radiated Emissions

Date of Tests: July 24, 2014

Measurements performed by Rex Zhang.

The environmental test conditions were: Temperature: 23.8 °C  
Relative Humidity: 26.9 %

### 802.11b Band

The measurements were performed on BlackBerry® smartphone in standalone, Vertical Up configuration on channels 1 and 11 for 802.11b mode at 1 Mbps.

The test distance was 3 meters.

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                    |                   |                           |
| 1.0     | 2412.00        | Horn       | V    | PK                | 1 MHz                       | 48.51                                    | 48.51                              | 74.00             | -25.49                    |
| 1.0     | 2412.00        | Horn       | H    | PK                | 1 MHz                       | 47.98                                    | 47.98                              | 74.00             | -26.02                    |
| 1.0     | 2412.00        | Horn       | V    | AV                | 10 Hz                       | 35.71                                    | 35.71                              | 54.00             | -18.29                    |
| 1.0     | 2412.00        | Horn       | H    | AV                | 10 Hz                       | 36.73                                    | 36.73                              | 54.00             | -17.27                    |

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                    |                   |                           |
| 11.0    | 2462.00        | Horn       | V    | PK                | 1 MHz                       | 48.07                                    | 48.07                              | 74.00             | -25.93                    |
| 11.0    | 2462.00        | Horn       | H    | PK                | 1 MHz                       | 50.91                                    | 50.91                              | 74.00             | -23.09                    |
| 11.0    | 2462.00        | Horn       | V    | AV                | 10 Hz                       | 36.10                                    | 36.10                              | 54.00             | -17.90                    |
| 11.0    | 2462.00        | Horn       | H    | AV                | 10 Hz                       | 38.60                                    | 38.60                              | 54.00             | -15.40                    |

|                                                                                   |                                                                              |                            |
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### 802.11g Band

The measurements were performed on the BlackBerry® smartphone in standalone, Vertical up configuration on channels 1 and 11 for 802.11g mode at 6 Mbps.

The test distance was 3 meters.

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band<br>edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|---------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                       |                   |                           |
| 1.0     | 2412.00        | Horn       | V    | PK                | 1 MHz                       | 55.47                                    | 55.47                                 | 74.00             | -18.53                    |
| 1.0     | 2412.00        | Horn       | H    | PK                | 1 MHz                       | 57.54                                    | 57.54                                 | 74.00             | -16.46                    |
| 1.0     | 2412.00        | Horn       | V    | AV                | 10 Hz                       | 38.47                                    | 38.47                                 | 54.00             | -15.53                    |
| 1.0     | 2412.00        | Horn       | H    | AV                | 10 Hz                       | 39.58                                    | 39.58                                 | 54.00             | -14.42                    |

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band<br>edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|---------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                       |                   |                           |
| 11.0    | 2462.00        | Horn       | V    | PK                | 1 MHz                       | 54.98                                    | 54.98                                 | 74.00             | -19.02                    |
| 11.0    | 2462.00        | Horn       | H    | PK                | 1 MHz                       | 56.49                                    | 56.49                                 | 74.00             | -17.51                    |
| 11.0    | 2462.00        | Horn       | V    | AV                | 10 Hz                       | 38.15                                    | 38.15                                 | 54.00             | -15.85                    |
| 11.0    | 2462.00        | Horn       | H    | AV                | 10 Hz                       | 39.81                                    | 39.81                                 | 54.00             | -14.19                    |

|                                                                                   |                                                                              |                            |
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### 802.11n Band

The measurements were performed on the BlackBerry® smartphone in standalone, Vertical up configuration on channels 1 and 11 for 802.11n mode at MCS 0.

The test distance was 3 meters.

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                    |                   |                           |
| 1.0     | 2412.00        | Horn       | V    | PK                | 1 MHz                       | 56.49                                    | 56.49                              | 74.00             | -17.51                    |
| 1.0     | 2412.00        | Horn       | H    | PK                | 1 MHz                       | 58.60                                    | 58.60                              | 74.00             | -15.40                    |
| 1.0     | 2412.00        | Horn       | V    | AV                | 10 Hz                       | 38.47                                    | 38.47                              | 54.00             | -15.53                    |
| 1.0     | 2412.00        | Horn       | H    | AV                | 10 Hz                       | 40.87                                    | 40.87                              | 54.00             | -13.13                    |

| Channel | Freq.<br>(MHz) | Rx Antenna |      | Detector<br>(MHz) | VBW<br>For Peak<br>(dBuV/m) | Peak<br>Corrected<br>Reading<br>(dBuV/m) | Corrected<br>Band edge<br>(dBuV/m) | Limit<br>(dBuV/m) | Diff. To<br>Limit<br>(dB) |
|---------|----------------|------------|------|-------------------|-----------------------------|------------------------------------------|------------------------------------|-------------------|---------------------------|
|         |                | Type       | POL. |                   |                             |                                          |                                    |                   |                           |
| 11.0    | 2462.00        | Horn       | V    | PK                | 1 MHz                       | 55.04                                    | 55.04                              | 74.00             | -18.96                    |
| 11.0    | 2462.00        | Horn       | H    | PK                | 1 MHz                       | 56.82                                    | 56.82                              | 74.00             | -17.18                    |
| 11.0    | 2462.00        | Horn       | V    | AV                | 10 Hz                       | 38.15                                    | 38.15                              | 54.00             | -15.85                    |
| 11.0    | 2462.00        | Horn       | H    | AV                | 10 Hz                       | 40.53                                    | 40.53                              | 54.00             | -13.47                    |

See figures 1-17 to 1-20 for the plots of the 802.11b band-edge compliance.  
See figures 1-21 to 1-24 for the plots of the 802.11g band-edge compliance.  
See figures 1-25 to 1-28 for the plots of the 802.11n band-edge compliance.



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## 802.11b/g/n Band-Edge Compliance of RF Radiated Emissions cont'd

Figure 1-17: Band-Edge Compliance of RF Radiated Emission  
802.11b, Channel 1, 2412 MHz, Max Pol: V,  
Detector: PK

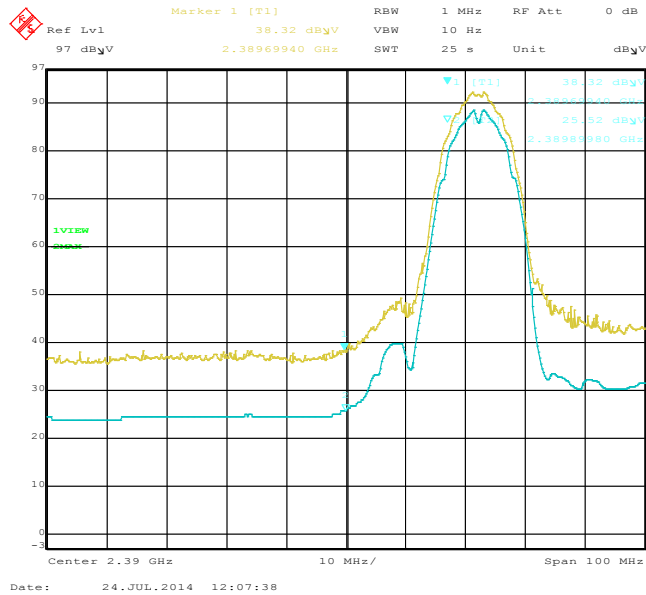


Figure 1-18: Band-Edge Compliance of RF Radiated Emission  
802.11b, Channel 1, 2412 MHz, Max Pol: H,  
Detector: PK

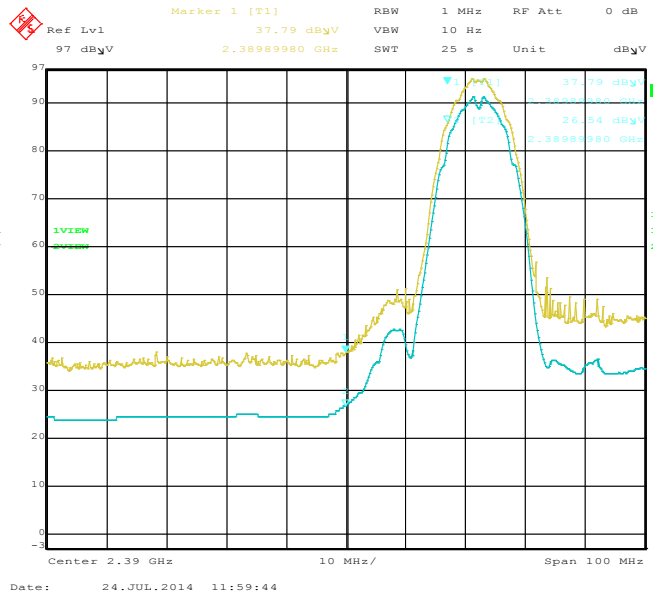


Figure 1-19: Band-Edge Compliance of RF Radiated Emission  
802.11b, Channel 11, 2462 MHz, Max Pol: V,  
Detector: PK

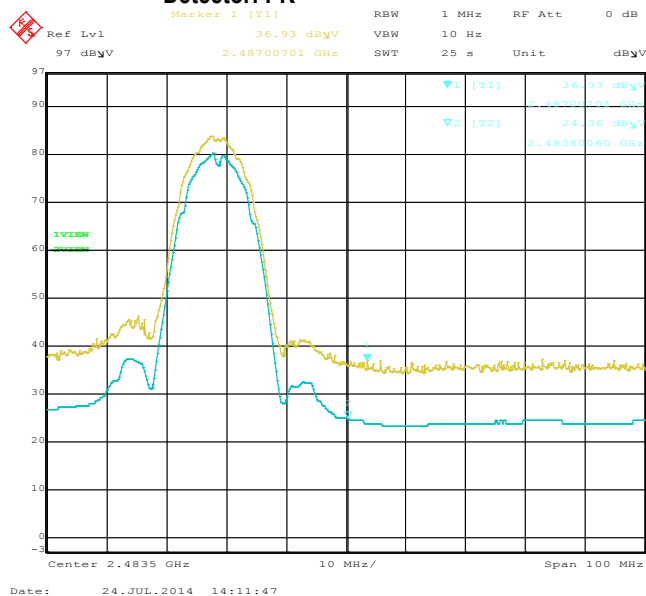
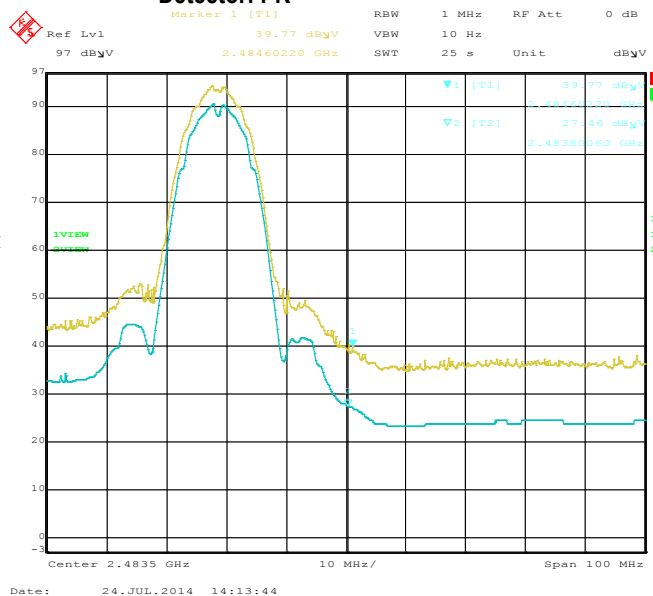


Figure 1-20: Band-Edge Compliance of RF Radiated Emission  
802.11b, Channel 11, 2462 MHz, Max Pol: H,  
Detector: PK





# EMC Test Report for the BlackBerry® smartphone RHB121LW

## APPENDIX 1

Test Report No.:  
RTS-6058-1408-08

Dates of Test:  
July 7 – August 5, 2014

FCC ID: L6ARHB120LW

Figure 1-21: Band-Edge Compliance of RF Radiated Emission  
802.11g, Channel 1, 2412 MHz, Max Pol: V,  
Detector: PK

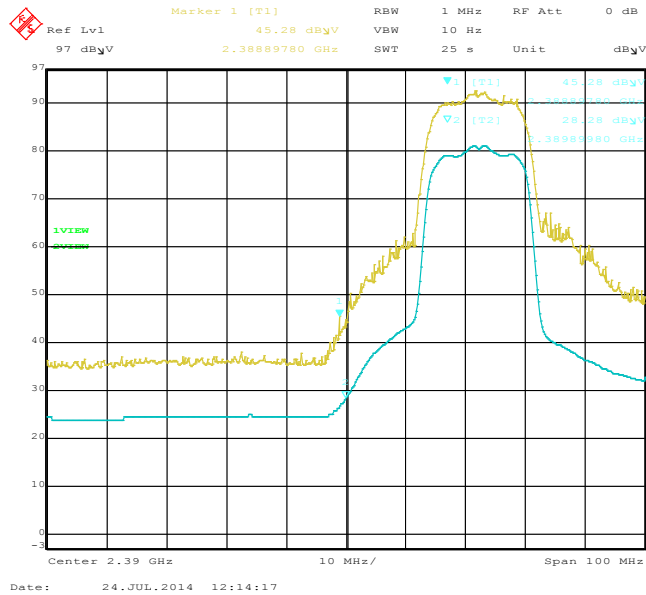


Figure 1-22: Band-Edge Compliance of RF Radiated Emission  
802.11g, Channel 1, 2412 MHz, Max Pol: H,  
Detector: PK

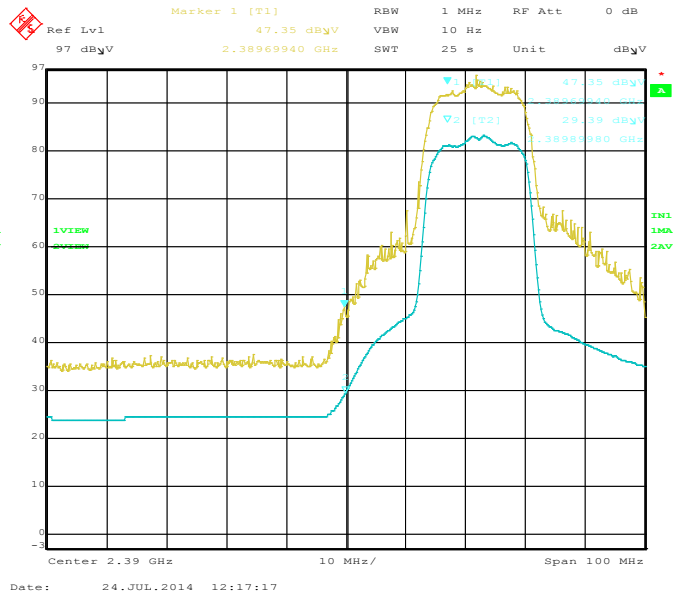


Figure 1-23: Band-Edge Compliance of RF Radiated Emission  
802.11g, Channel 11, 2462 MHz, Max Pol: V,  
Detector: PK

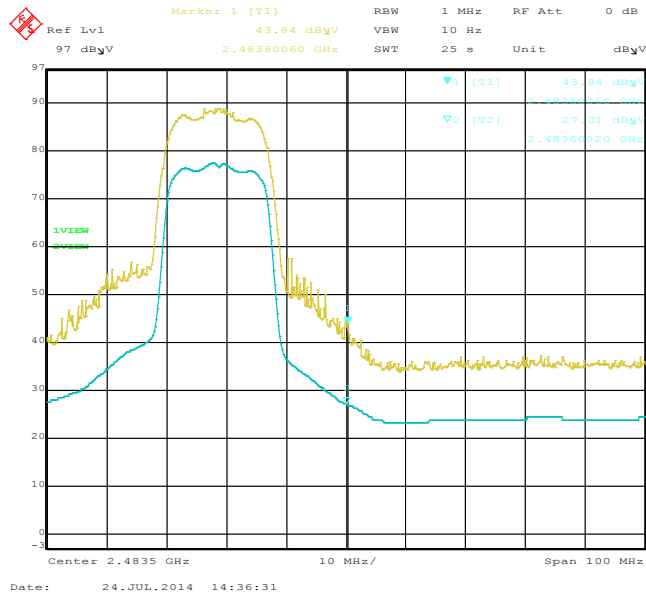
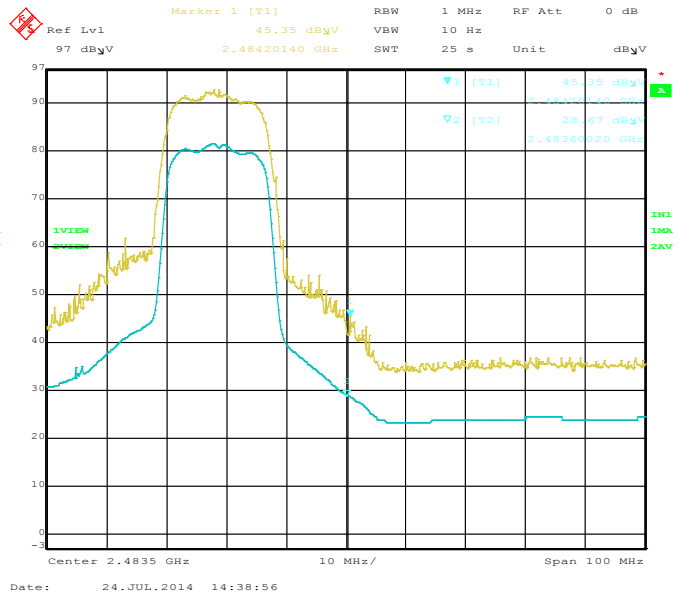


Figure 1-24: Band-Edge Compliance of RF Radiated Emission  
802.11g, Channel 11, 2462 MHz, Max Pol: H,  
Detector: PK





# EMC Test Report for the BlackBerry® smartphone RHB121LW

## APPENDIX 1

Test Report No.:  
RTS-6058-1408-08

Dates of Test:  
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FCC ID: L6ARHB120LW

Figure 1-25: Band-Edge Compliance of RF Radiated Emission  
802.11n, Channel 1, 2412 MHz, Max Pol: V,  
Detector: PK

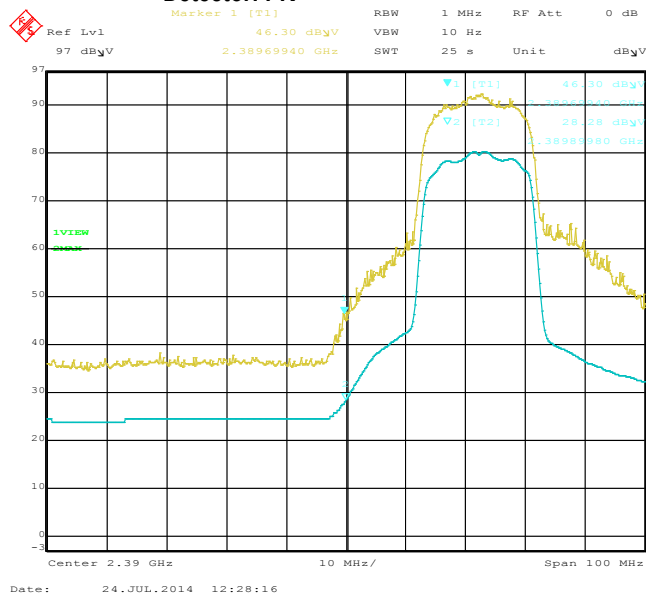


Figure 1-26: Band-Edge Compliance of RF Radiated Emission  
802.11n, Channel 1, 2412 MHz, Max Pol: H,  
Detector: PK

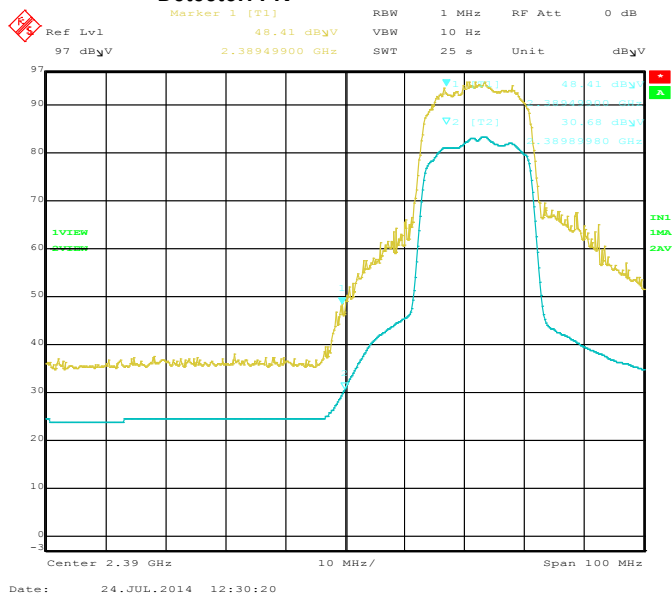


Figure 1-27: Band-Edge Compliance of RF Radiated Emission  
802.11n, Channel 11, 2462 MHz, Max Pol: V,  
Detector: PK

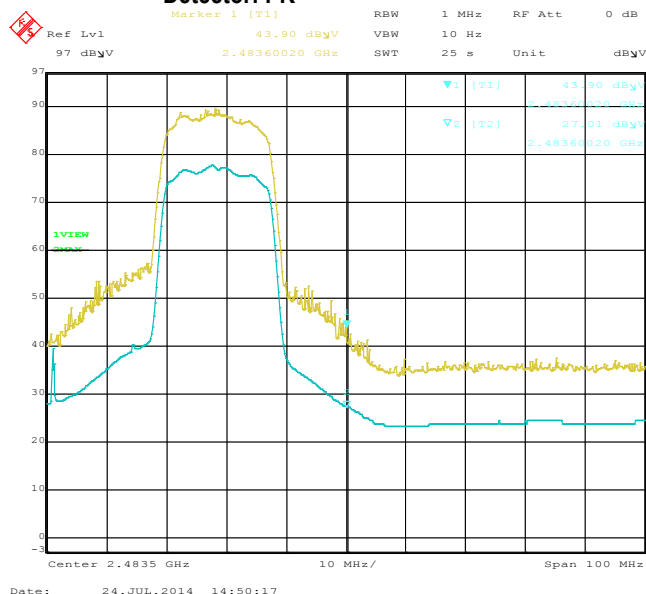
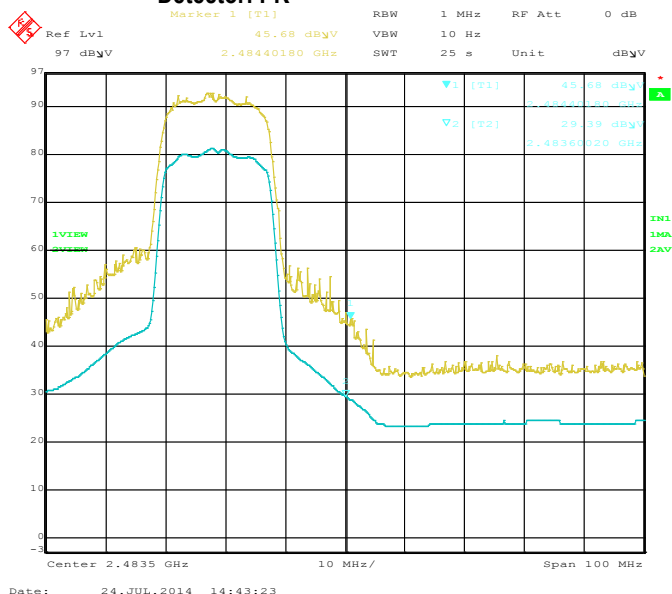


Figure 1-28: Band-Edge Compliance of RF Radiated Emission  
802.11n, Channel 11, 2462 MHz, Max Pol: H,  
Detector: PK

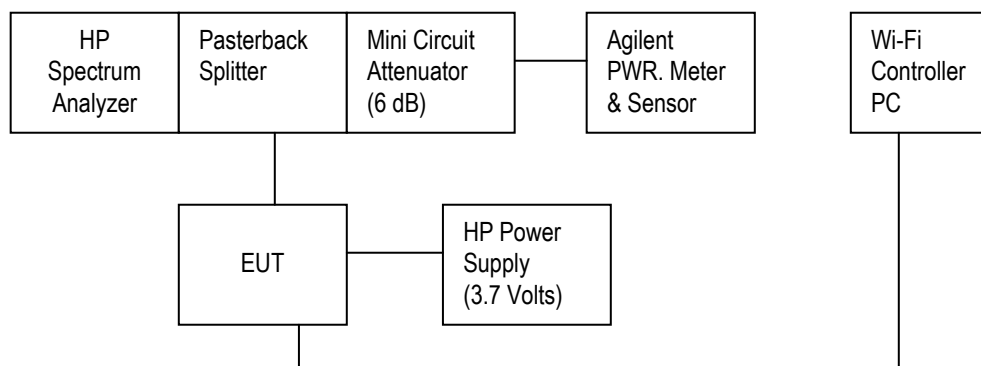


## **APPENDIX 2 – 802.11b/g/n CONDUCTED EMISSIONS TEST DATA/PLOTS**

|                                             |                                                                                    |                            |
|---------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
| <b>BlackBerry</b>                           | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 2</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08 | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11b/g/n RF Conducted Emission Test Results

#### Test Setup Diagram



| <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               |

A reference offset of 20.4 dB was applied to the spectrum analyzer and 6.6 dB was applied to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: July 15, 2014

The measurements on the BlackBerry® smartphone were performed by Chuan Tran.

The environmental test conditions were:    Temperature:        23.5 °C  
                                                                          Relative Humidity:    26.7 %

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 2</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11b/g/n RF Conducted Emission Test Results cont'd

#### **Maximum Conducted Output Power**

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.247(b)(3). Channels 1, 6 and 11 were measured at 1 Mbps, 5.5 Mbps, and 11 Mbps each for 802.11b mode, 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11g mode, and MCS 0, 4 and 7 for 802.11n mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 18.4 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

| Channel | Data Rate | Class 2 Limit (W) | Measured Level (dBm) | Measured Level (mW) |
|---------|-----------|-------------------|----------------------|---------------------|
| 1       | 1 Mbps    | < 1.00            | 17.26                | 53.21               |
|         | 5.5 Mbps  | < 1.00            | 17.29                | 53.58               |
|         | 11 Mbps   | < 1.00            | 17.09                | 51.17               |
|         | 6 Mbps    | < 1.00            | 15.07                | 32.14               |
|         | 24 Mbps   | < 1.00            | 14.67                | 29.31               |
|         | 54 Mbps   | < 1.00            | 14.22                | 26.42               |
|         | MCS 0     | < 1.00            | 14.24                | 26.55               |
|         | MCS 4     | < 1.00            | 14.26                | 26.67               |
|         | MCS 7     | < 1.00            | 14.22                | 26.42               |
| 6       | 1 Mbps    | < 1.00            | <b>19.78</b>         | 95.06               |
|         | 5.5 Mbps  | < 1.00            | 19.75                | 94.41               |
|         | 11 Mbps   | < 1.00            | 19.60                | 91.20               |
|         | 6 Mbps    | < 1.00            | <b>19.31</b>         | 85.31               |
|         | 24 Mbps   | < 1.00            | 16.91                | 49.09               |
|         | 54 Mbps   | < 1.00            | 15.44                | 34.99               |
|         | MCS 0     | < 1.00            | <b>15.42</b>         | 34.83               |
|         | MCS 4     | < 1.00            | 15.38                | 34.51               |
|         | MCS 7     | < 1.00            | 15.33                | 34.12               |

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 2</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

802.11b/g/n RF Conducted Emission Test Results cont'd

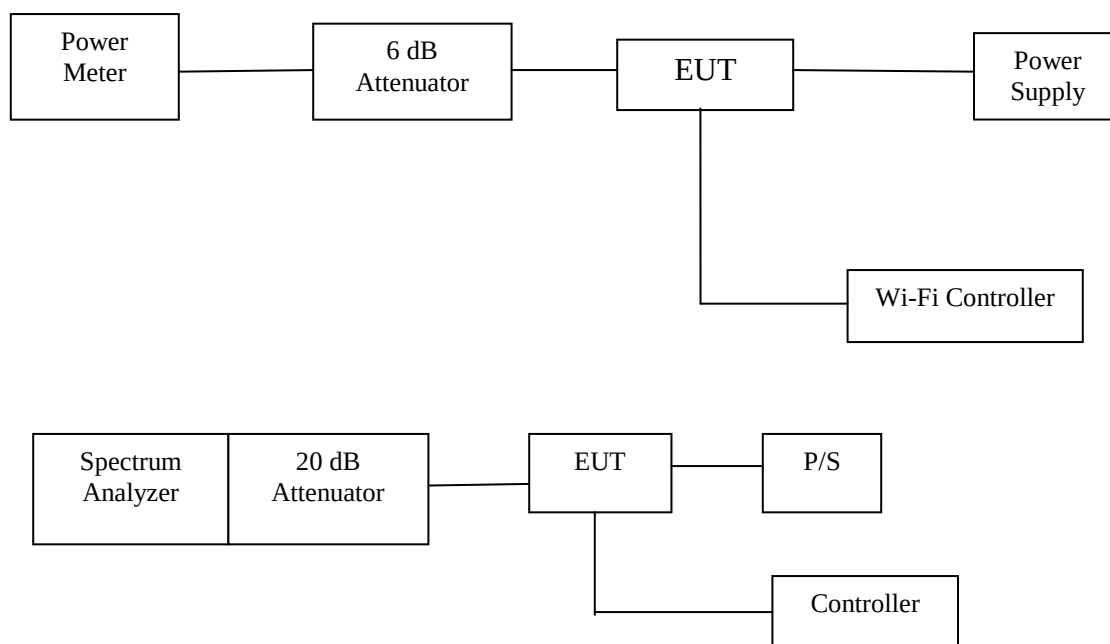
| Channel | Data Rate | Class 2<br>Limit (W) | Measured Level<br>(dBm) | Measured Level<br>(mW) |
|---------|-----------|----------------------|-------------------------|------------------------|
| 11      | 1 Mbps    | < 1.00               | 18.61                   | 72.61                  |
|         | 5.5 Mbps  | < 1.00               | 18.64                   | 73.11                  |
|         | 11 Mbps   | < 1.00               | 18.40                   | 69.18                  |
|         | 6 Mbps    | < 1.00               | 13.04                   | 20.14                  |
|         | 24 Mbps   | < 1.00               | 12.68                   | 18.54                  |
|         | 54 Mbps   | < 1.00               | 12.17                   | 16.48                  |
|         | MCS 0     | < 1.00               | 12.15                   | 16.41                  |
|         | MCS 4     | < 1.00               | 12.20                   | 16.60                  |
|         | MCS 7     | < 1.00               | 12.26                   | 16.83                  |

## **APPENDIX 3 – 802.11a/n CONDUCTED EMISSIONS TEST DATA/PLOTS**

|                                             |                                                                                    |                            |
|---------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
| <b>BlackBerry</b>                           | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08 | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11a/n RF Conducted Emission Test Results

#### Test Setup Diagram



A reference offset of 8.9 dB was applied to the spectrum analyzer and 7.4 dB to the Power Meter reference level for the attenuators and coaxial cable loss in the test circuit.

Date of test: July 15, 2014

The measurements were performed by Chuan Pao Tran.

The environmental test conditions were:    Temperature:        23.5 °C  
                                                                          Relative Humidity:    26.7 %

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11a RF Conducted Emission Test Results

#### **Maximum Conducted Output Power**

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.407 . Channels 36, 48, 64, 100, 140 and 165 were measured for 802.11a mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

| Channel | Data Rate | Power Limit (mW) | Measured Level (dBm) | Measured Level (mW) |
|---------|-----------|------------------|----------------------|---------------------|
| 36      | 6 Mbps    | < 250.0          | 14.08                | 25.59               |
|         | 24 Mbps   | < 250.0          | 13.65                | 23.17               |
|         | 54 Mbps   | < 250.0          | 13.14                | 20.61               |
| 48      | 6 Mbps    | < 250.0          | 13.86                | 24.32               |
|         | 24 Mbps   | < 250.0          | 13.42                | 21.98               |
|         | 54 Mbps   | < 250.0          | 12.94                | 19.68               |
| 64      | 6 Mbps    | < 250.0          | 13.59                | 22.86               |
|         | 24 Mbps   | < 250.0          | 13.65                | 23.17               |
|         | 54 Mbps   | < 250.0          | 13.64                | 23.12               |
| 100     | 6 Mbps    | < 250.0          | 13.05                | 20.18               |
|         | 24 Mbps   | < 250.0          | 13.04                | 20.14               |
|         | 54 Mbps   | < 250.0          | 13.07                | 20.28               |
| 140     | 6 Mbps    | < 250.0          | <b>14.38</b>         | 27.42               |
|         | 24 Mbps   | < 250.0          | 14.38                | 27.42               |
|         | 54 Mbps   | < 250.0          | 14.37                | 27.35               |
| 165     | 6 Mbps    | < 1000           | 11.46                | 14.00               |
|         | 24 Mbps   | < 1000           | 10.90                | 12.30               |
|         | 54 Mbps   | < 1000           | 10.50                | 11.22               |

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11n RF Conducted Emission Test Results

#### **Maximum Conducted Output Power**

The EUT met the requirements of the maximum conducted output power of class 2 as per 47 CFR 15.407. Channels 36, 48, 64, 100, 140 and 165 were measured for 802.11n mode using an Agilent power meter, model N1911A with model N1921A power sensor. A reference offset of 8.9 dB was applied to the power meter reference level for the coaxial cable loss and attenuators in the test circuit.

| Channel | Data Rate | Class 2 Limit (W) | Measured Level (dBm) | Measured Level (mW) |
|---------|-----------|-------------------|----------------------|---------------------|
| 36      | MCS0      | < 250.0           | 13.14                | 20.61               |
|         | MCS4      | < 250.0           | 13.11                | 20.46               |
|         | MCS7      | < 250.0           | 13.11                | 20.46               |
| 48      | MCS0      | < 250.0           | 12.99                | 19.91               |
|         | MCS4      | < 250.0           | 13.00                | 19.95               |
|         | MCS7      | < 250.0           | 12.94                | 19.68               |
| 64      | MCS0      | < 250.0           | 13.61                | 22.96               |
|         | MCS4      | < 250.0           | 13.63                | 23.07               |
|         | MCS7      | < 250.0           | 13.67                | 23.28               |
| 100     | MCS0      | < 250.0           | 13.08                | 20.32               |
|         | MCS4      | < 250.0           | 13.08                | 20.32               |
|         | MCS7      | < 250.0           | 13.02                | 20.04               |
| 140     | MCS0      | < 250.0           | <b>14.41</b>         | 27.61               |
|         | MCS4      | < 250.0           | 14.37                | 27.35               |
|         | MCS7      | < 250.0           | 14.40                | 27.54               |
| 165     | MCS0      | < 1000            | 10.41                | 10.99               |
|         | MCS4      | < 1000            | 10.47                | 11.14               |
|         | MCS7      | < 1000            | 10.42                | 11.02               |

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11a RF Conducted Emission Test Results cont'd

#### **Peak Power Spectral Density**

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 . Channels 36, 48, 64, 100, 140 and 165 were measured at 6 Mbps, 24 Mbps, and 54 Mbps each for 802.11a mode.

| Channel | Data Rate | Limit (dBm) | Measured Level (dBm) | Margin (dBm) |
|---------|-----------|-------------|----------------------|--------------|
| 36      | 6 Mbps    | < 11.00     | 2.77                 | -1.23        |
|         | 24 Mbps   | < 11.00     | 3.10                 | -0.90        |
|         | 54 Mbps   | < 11.00     | 3.18                 | -0.82        |
| 48      | 6 Mbps    | < 11.00     | 2.97                 | -1.03        |
|         | 24 Mbps   | < 11.00     | 2.98                 | -1.02        |
|         | 54 Mbps   | < 11.00     | 3.05                 | -0.95        |
| 64      | 6 Mbps    | < 11.00     | 3.00                 | -8.00        |
|         | 24 Mbps   | < 11.00     | 2.87                 | -8.13        |
|         | 54 Mbps   | < 11.00     | 2.82                 | -8.18        |
| 100     | 6 Mbps    | < 11.00     | 2.66                 | -8.34        |
|         | 24 Mbps   | < 11.00     | 2.67                 | -8.33        |
|         | 54 Mbps   | < 11.00     | 2.62                 | -8.38        |
| 140     | 6 Mbps    | < 11.00     | 4.36                 | -6.64        |
|         | 24 Mbps   | < 11.00     | 4.44                 | -6.56        |
|         | 54 Mbps   | < 11.00     | 4.37                 | -6.63        |
| 165     | 6 Mbps    | < 17.00     | -13.32               | -30.32       |
|         | 24 Mbps   | < 17.00     | -14.38               | -31.38       |
|         | 54 Mbps   | < 17.00     | -14.27               | -31.27       |

See figures 3-1 to 3-6 for the plots of the peak power spectral density for Channel 36, 48, 64, 100, 140, and 165 at 6 Mbps each for 802.11a mode.

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11n RF Conducted Emission Test Results

#### **Peak Power Spectral Density**

The EUT met the requirements of the peak power spectral density as per 47 CFR 15.407 . Channels 36, 64 and 165 were measured at MCS 0, MCS 4 and MCS 7 each for 802.11n mode.

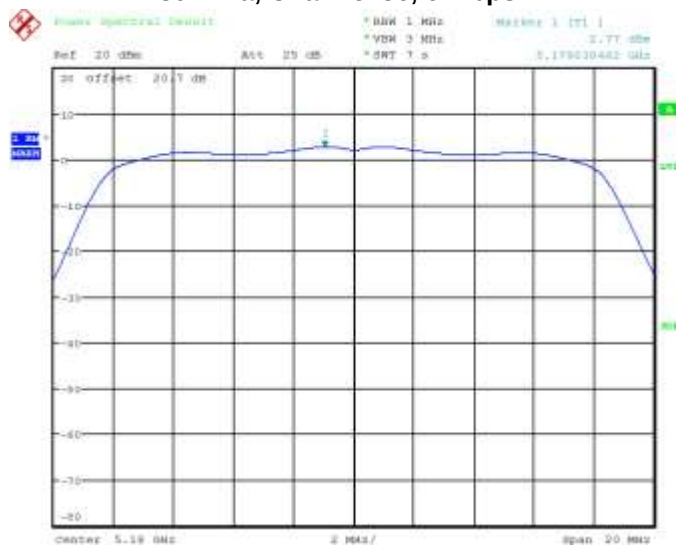
| Channel | Data Rate | Limit (dBm) | Measured Level (dBm) | Margin (dBm) |
|---------|-----------|-------------|----------------------|--------------|
| 36      | 6 Mbps    | < 11.00     | 2.70                 | -1.30        |
|         | 24 Mbps   | < 11.00     | 2.75                 | -1.25        |
|         | 54 Mbps   | < 11.00     | 2.72                 | -1.28        |
| 64      | 6 Mbps    | < 11.00     | 2.36                 | -8.64        |
|         | 24 Mbps   | < 11.00     | 2.38                 | -8.62        |
|         | 54 Mbps   | < 11.00     | 2.37                 | -8.63        |
| 165     | 6 Mbps    | < 17.00     | -14.05               | -31.05       |
|         | 24 Mbps   | < 17.00     | -12.87               | -29.87       |
|         | 54 Mbps   | < 17.00     | -14.31               | -31.31       |

See figures 3-7 to 3-9 for the plots of the peak power spectral density for Channel 36, 64 and 165 at MCS 0 each for 802.11n mode.

|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11a RF Conducted Emission Test Results cont'd

**Figure 3-1: Peak Power Spectral Density  
802.11a, Channel 36, 6 Mbps**



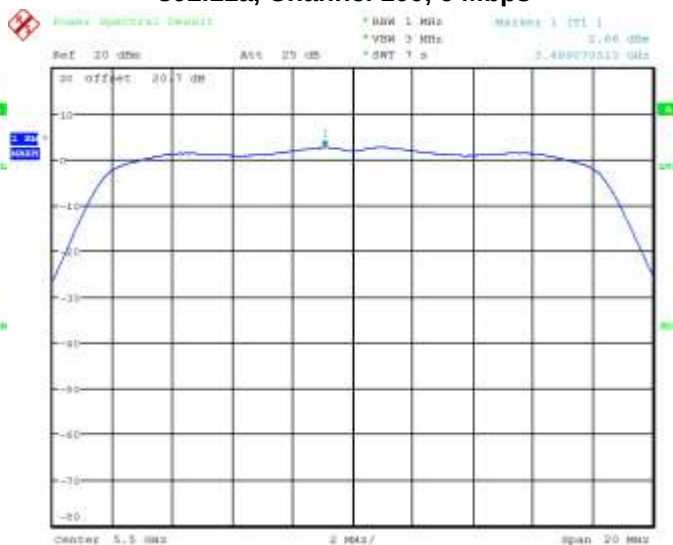
**Figure 3-2: Peak Power Spectral Density  
802.11a, Channel 48, 6 Mbps**



**Figure 3-3: Peak Power Spectral Density  
802.11a, Channel 64, 6 Mbps**



**Figure 3-4: Peak Power Spectral Density  
802.11a, Channel 100, 6 Mbps**



|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

802.11a RF Conducted Emission Test Results cont'd

Figure 3-5: Peak Power Spectral Density  
802.11a, Channel 140, 6 Mbps

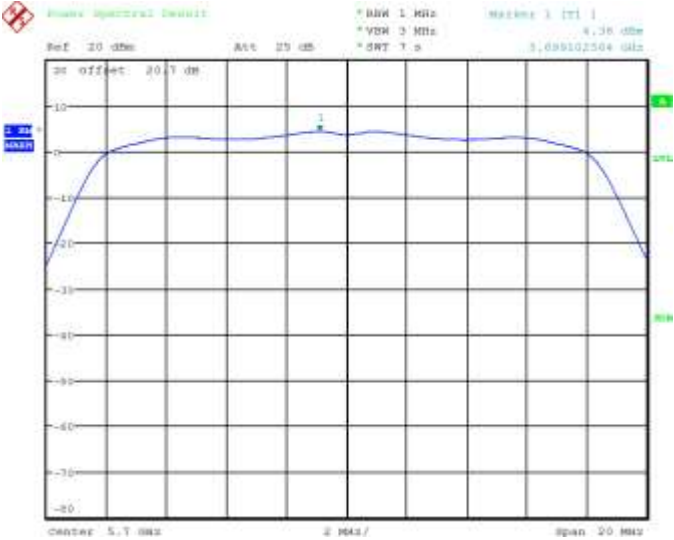
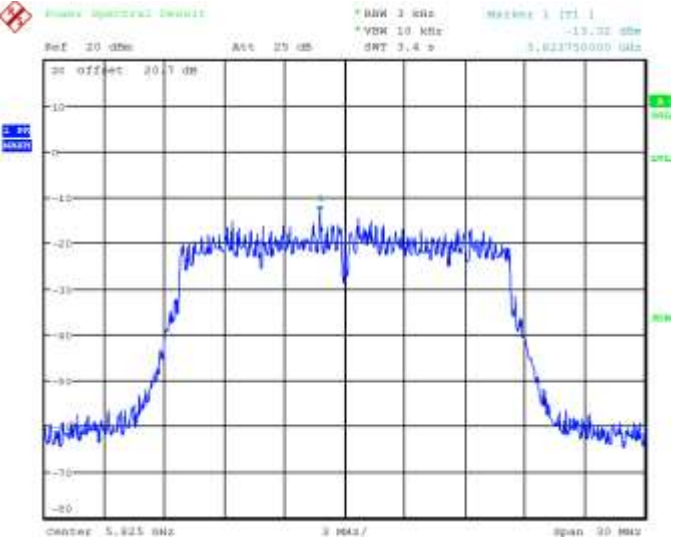


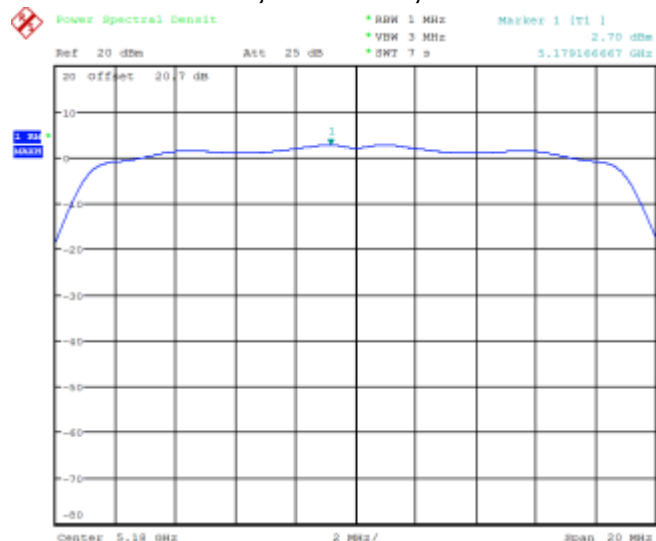
Figure 3-6: Peak Power Spectral Density  
802.11a, Channel 165, 6 Mbps



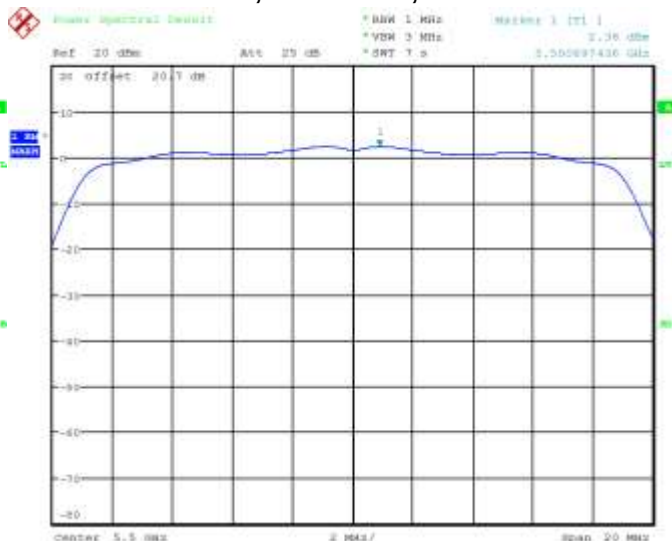
|                                                                                   |                                                                                    |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
|  | EMC Test Report for the BlackBerry® smartphone Model RHB121LW<br><b>APPENDIX 3</b> |                            |
| <b>Test Report No.:</b><br>RTS-6058-1408-08                                       | <b>Dates of Test:</b><br>July 7 – August 5, 2014                                   | <b>FCC ID:</b> L6ARHB120LW |

### 802.11n RF Conducted Emission Test Results

**Figure 3-7: Peak Power Spectral Density  
802.11n, Channel 36, MCS 0**



**Figure 3-8: Peak Power Spectral Density  
802.11n, Channel 64, MCS 0**



**Figure 3-9: Peak Power Spectral Density  
802.11n, Channel 165, MCS 0**

