# EMI Partial Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Part 15 Subpart C
&
Industry Canada (IC) RSS-210, RSS-GEN


## A division of Research In Motion Limited

**REPORT NO.**: RTS-2337-1012-27

**PRODUCT MODEL NO.**: RCY71UW
**TYPE NAME**: BlackBerry® smartphone
**FCC ID**: L6ARCY70UW
**IC**: 2503A-RCY70UW

**DATE**: December 10, 2010

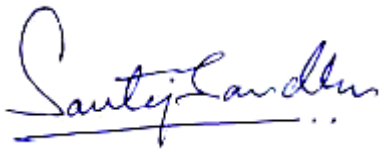
## Statement of Performance:

The BlackBerry® smartphone, model RCY71UW, part number CER-30957-001 Rev. 6, and its accessories perform within the requirements of the test standards when configured and operated under RIM'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:



Savtej S. Sandhu
Regulatory Compliance Specialist
Date: December 14, 2010

Reviewed by:

Maurice Battler
Regulatory Compliance Specialist
Date: December 15, 2010

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance
Date: December 17, 2010

## Table of Contents

## A. Scope

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

- FCC CFR 47 Part 15, Subpart C, October, 2009
- Industry Canada, RSS-210, Issue 7, June 2007, Low Power Licence-Exempt Radiocommunication Devices
- Industry Canada, RSS-GEN, Issue 2, June 2007, General Requirements and Information for the Certification of Radiocommunication Equipment

## B. Associated Documents

1. RCY71UW_HW_Declaration_CER-30957_Rev6
2. RCY71UW_HW_Declaration_CER-30957_Rev5
3. RCY71UW_HW_Declaration_CER-30957_Rev4
4. RTS-2337-1010-32
5. RTS-2337-1003-20

## C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:

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

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

RIM Testing Services EMI test facilities

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

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

The testing was performed from November 25 to December 07, 2010.

The sample EUT included:

| SAMPLE | MODEL | CER NUMBER | PIN | Software |
|---|---|---|---|---|
| 1 | RCY71UW | CER-30957-001 Rev. 6 | 2358614A | MFI v6.0.0.b277 |
| 2 | RCY71UW | CER-30957-001 Rev. 6 | 235861AE | MFI v6.0.0.b277 |

Samples 1 and 2 were used for 802.11b/g/n Radiated Emissions testing.

Only the characteristics that may have been affected by the changes from model RCY71UW Rev 3 to model RCY71UW Rev 6 were re-tested.
For more details, refer to RCY71UW_HW_Declaration_CER-30957_Rev6, RCY71UW_HW_Declaration_CER-30957_Rev5 and RCY71UW_HW_Declaration_CER-30957_Rev4.

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

No support equipment used. See section *G. Compliance Test Equipment Used*.

## E. Test Results Chart

| SPECIFICATION | | TEST TYPE | Meets Requirements | TEST DATA |
|---|---|---|---|---|
| FCC CFR 47 | IC | | | APPENDIX |
| Part 15.207 | RSS-210 RSS-GEN | Conducted AC Line Emission | See Test Report RTS-2337-1003-20 | - |
| Part 15.209 Part 15.247 | RSS-210 RSS-GEN | BT Radiated Spurious Emissions | See Test Report RTS-2337-1010-32 | - |
| Part 15.209 Part 15.247 | RSS-210 RSS-GEN | BT Radiated Band Edge Compliance | See Test Report RTS-2337-1003-20 | - |
| Part 15.209 Part 15.247 | RSS-210 RSS-GEN | 802.11 b/g/n Radiated Spurious Emissions | Pass | 1 |
| Part 15.209 Part 15.247 | RSS-210 RSS-GEN | 802.11 b/g/n Radiated Band Edge Compliance | Pass | 1 |
| Part 15.247(a) | RSS-210 | BT, 20 dB Bandwidth | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(a) | RSS-210 | BT, Carrier Frequency Separation | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(a) | RSS-210 | BT, Number of Hopping Frequencies | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(a) | RSS-210 | BT, Time of Occupancy (Dwell Time) | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | BT, Maximum Peak Conducted Output Power | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(c) | RSS-210 | BT, Band-Edge Compliance of RF Conducted Emissions | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(c) | RSS-210 | BT, Spurious RF Conducted Emissions | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | 802.11b/g/n, 6 dB Bandwidth | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | 802.11b/g/n, Maximum Conducted Output Power | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | 802.11b/g/n, Band-Edge | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | 802.11b/g/n, Peak Power Spectral Density | See Test Report RTS-2337-1003-20 | - |
| Part 15.247(b) | RSS-210 | 802.11b/g/n, Spurious RF Conducted Emissions | See Test Report RTS-2337-1003-20 | - |

## F. Summary of Results

1) 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 fully-anechoic room (FAR) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The FAR'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 RIM's specifications.

The BlackBerry® smartphone was measured in standalone configuration transmitting on channel 6 at 1 Mbps, 6 Mbps and MCS 0 for 802.11b/g/n modes. The system's radiated emission levels were compared with respect to the FCC CFR 47 Part 15 Subpart C, 15.247 and RSS-210.

The 802.11b/g/n harmonics were investigated up to the 10th harmonic. All emissions were in the noise floor.
See APPENDIX 1 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 802.11b/g/n as per the requirements of 15.247, 15.209, and RSS-210/RSS-GEN.

**Measurement Uncertainty ±4.6 dB**
See APPENDIX 1 for the test data.

## G. Compliance Test Equipment Used

| UNIT | MANUFACTURER | MODEL | SERIAL NUMBER | CAL DUE DATE (YY MM DD) | USE |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESIB 40 | 100255 | 11-11-28 | Radiated Emissions |
| EMI Test Receiver | Rohde & Schwarz | ESU 40 | 100162 | 11-11-29 | Radiated Emissions |
| Hybrid Log Antenna | EMC Automation | HLP-3003C | 017401 | 10-12-16 | Radiated Emissions |
| Horn Antenna | CMT | LHA 0180 | R52734-001 | 12-01-21 | Radiated Emissions |
| Horn Antenna | ETS-Lindgren | 3117 | 47563 | 11-07-15 | Radiated Emissions |
| Preamplifier | Rohde & Schwarz | TS-ANA4-SP | 001 | 11-01-22 | Radiated Emissions |
| Preamplifier | Rohde & Schwarz | TS-ANA-SP | 001 | 11-01-06 | Radiated Emissions |
| Preamplifier | Sonoma | 310N/11909A | 185831 | 11-11-24 | Radiated Emissions |
| Environment Monitor | Omega | iTHX-SD | 0380561 | 11-10-13 | Radiated Emissions |
| Environment Monitor | Omega | iTHX-SD | 0380567 | 11-10-13 | Radiated Emissions |
| EMC Analyzer | Agilent | E7405A | US40240226 | 10-12-10 | Radiated Emissions |

# APPENDIX 1 – 802.11b/g/n RADIATED EMISSIONS TEST DATA

## Radiated Emissions Test Results
## 802.11b/g/n Band

Date of Test: November 25, 2010
Measurements were performed by Quan Ma.

The environmental test conditions were: Temperature: 23 – 25 ºC
Relative Humidity: 16 – 30 %

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

The BlackBerry® smartphone was in USB down (open) position.

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

All emissions had a test margin greater than 25.0 dB.

Date of Test: November 30 to December 07, 2010
Measurements were performed by Adam Rusinek.

The environmental test conditions were: Temperature: 24 – 25 ºC
Relative Humidity: 21 – 39 %

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

The BlackBerry® smartphone was in USB up (open) position.

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

All emissions had a test margin greater than 25.0 dB.

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

Date of Tests: November 25, 2010
Measurements performed by Kevin Rose.

The environmental test conditions were: Temperature: 24 ºC
Relative Humidity: 19 %

## 802.11b Band

The measurements were performed on the BlackBerry® smartphone in standalone, USB down (slide open) position on channel 6 for 802.11b mode at 1 Mbps.

The test distance was 3 metres.

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | 2412.00 | Horn | V | PK | 1 MHz | 104.21 | 51.34 | 52.87 | 74.00 | -21.13 |
| 1 | 2412.00 | Horn | H | PK | 1 MHz | 105.76 | 50.22 | 55.54 | 74.00 | -18.46 |
| 1 | 2412.00 | Horn | V | AV | 10 Hz | 100.05 | 51.34 | 48.71 | 54.00 | -5.29 |
| 1 | 2412.00 | Horn | H | AV | 10 Hz | 101.65 | 50.22 | 51.43 | 54.00 | -2.57 |

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 11 | 2480.00 | Horn | V | PK | 1 MHz | 105.63 | 55.95 | 49.68 | 74.00 | -24.32 |
| 11 | 2480.00 | Horn | H | PK | 1 MHz | 107.15 | 57.40 | 49.75 | 74.00 | -24.25 |
| 11 | 2480.00 | Horn | V | AV | 10 Hz | 101.39 | 55.95 | 45.44 | 54.00 | -8.56 |
| 11 | 2480.00 | Horn | H | AV | 10 Hz | 102.94 | 57.40 | 45.54 | 54.00 | -8.46 |

## 802.11g Band

The measurements were performed on the BlackBerry® smartphone in standalone, USB down (slide open) position on channel 6 for 802.11g mode at 6 Mbps.

The test distance was 3 metres.

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | 2412.00 | Horn | V | PK | 1 MHz | 102.08 | 41.03 | 61.05 | 74.00 | -12.95 |
| 1 | 2412.00 | Horn | H | PK | 1 MHz | 105.46 | 44.97 | 60.49 | 74.00 | -13.51 |
| 1 | 2412.00 | Horn | V | AV | 10 Hz | 88.09 | 41.03 | 47.06 | 54.00 | -6.94 |
| 1 | 2412.00 | Horn | H | AV | 10 Hz | 89.22 | 44.97 | 44.25 | 54.00 | -9.75 |

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 11 | 2480.00 | Horn | V | PK | 1 MHz | 105.13 | 54.68 | 50.45 | 74.00 | -23.55 |
| 11 | 2480.00 | Horn | H | PK | 1 MHz | 103.68 | 55.04 | 48.64 | 74.00 | -25.36 |
| 11 | 2480.00 | Horn | V | AV | 10 Hz | 88.58 | 54.68 | 33.90 | 54.00 | -20.10 |
| 11 | 2480.00 | Horn | H | AV | 10 Hz | 90.16 | 55.04 | 35.12 | 54.00 | -18.88 |

## 802.11n Band

The measurements were performed on the BlackBerry® smartphone in standalone, USB down (slide open) position on channel 6 for 802.11n mode at MCS 0.

The test distance was 3 metres.

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | 2412.00 | Horn | V | PK | 1 MHz | 100.91 | 40.43 | 60.48 | 74.00 | -13.52 |
| 1 | 2412.00 | Horn | H | PK | 1 MHz | 102.20 | 40.69 | 61.51 | 74.00 | -12.49 |
| 1 | 2412.00 | Horn | V | AV | 10 Hz | 87.70 | 40.43 | 47.27 | 54.00 | -6.73 |
| 1 | 2412.00 | Horn | H | AV | 10 Hz | 88.74 | 40.69 | 48.05 | 54.00 | -5.95 |

| Channel | Freq. | Rx Antenna | | Detector | VBW For Peak | Peak Corrected Reading | Delta Marker | Corrected Band edge | Limit | Diff. To Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | Type | POL. | (MHz) | (dBuV/m) | (dBuV/m) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 11 | 2480.00 | Horn | V | PK | 1 MHz | 101.64 | 54.12 | 47.52 | 74.00 | -26.48 |
| 11 | 2480.00 | Horn | H | PK | 1 MHz | 104.15 | 54.19 | 49.96 | 74.00 | -24.04 |
| 11 | 2480.00 | Horn | V | AV | 10 Hz | 87.79 | 54.12 | 33.67 | 54.00 | -20.33 |
| 11 | 2480.00 | Horn | H | AV | 10 Hz | 89.52 | 54.19 | 35.33 | 54.00 | -18.67 |

See figures 1-1 to 1-4 for the plots of the 802.11b band-edge compliance.
See figures 1-5 to 1-8 for the plots of the 802.11g band-edge compliance.
See figures 1-9 to 1-12 for the plots of the 802.11n band-edge compliance.

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

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

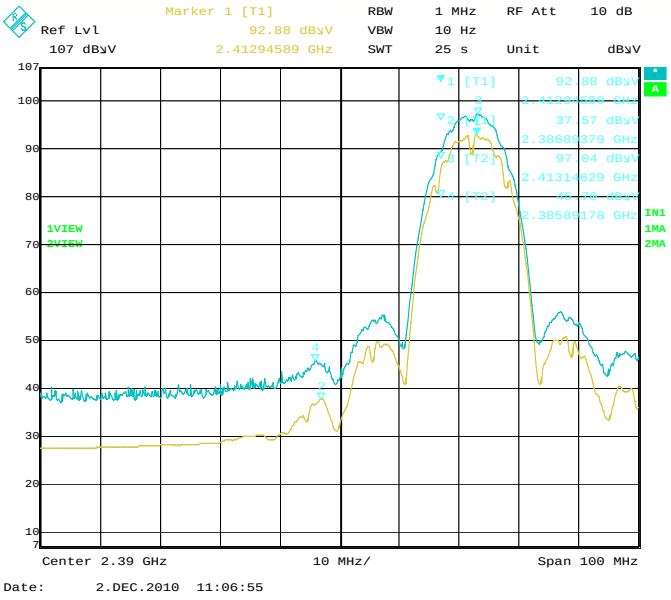



Figure 1-2: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

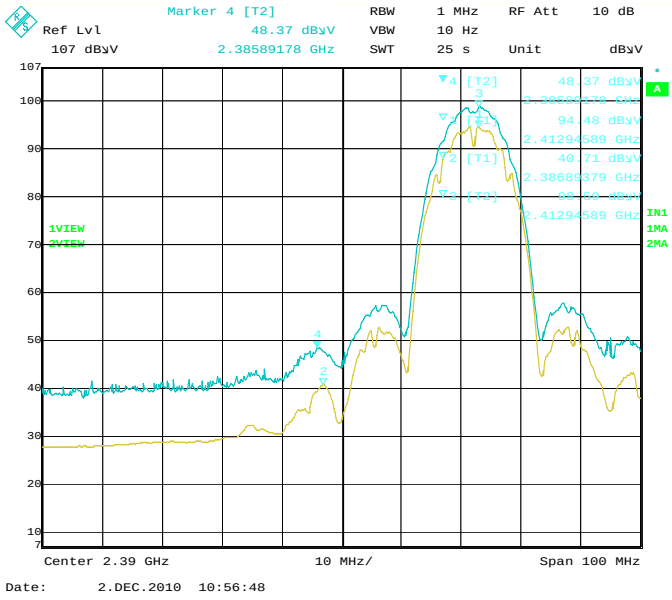



Figure 1-3: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 11, 2480 MHz, Max Pol: V,
Detector: PK

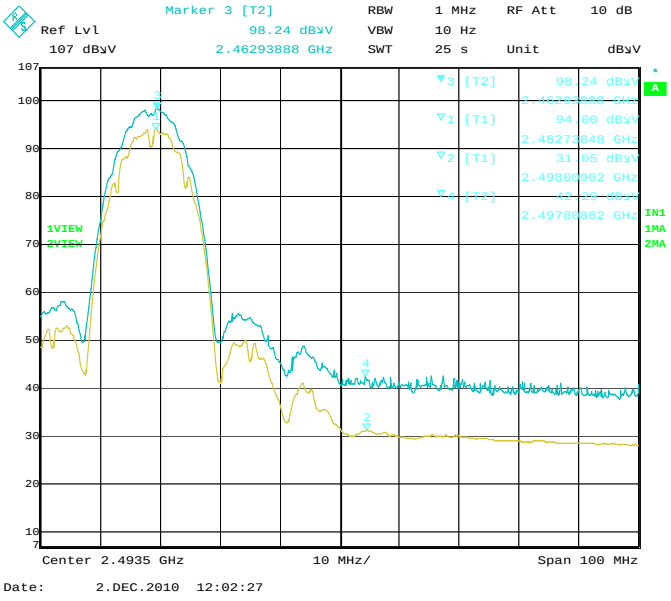



Figure 1-4: Band-Edge Compliance of RF Radiated Emission
802.11b, Channel 11, 2480 MHz, Max Pol: H,
Detector: PK

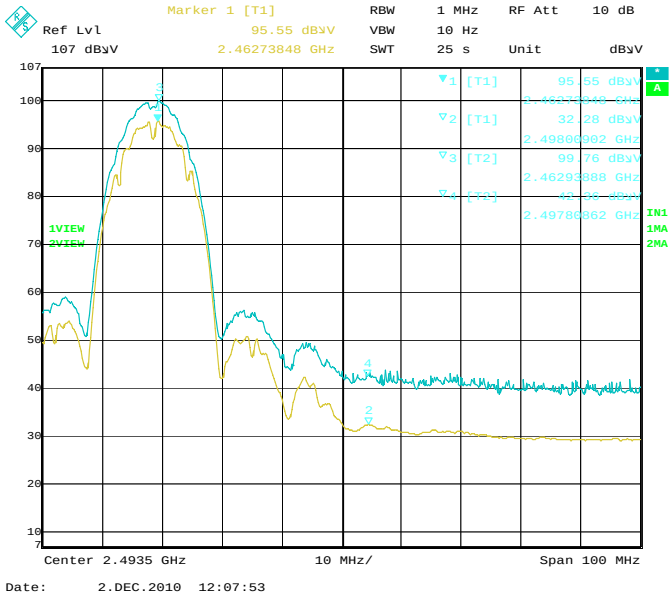


Figure 1-5: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

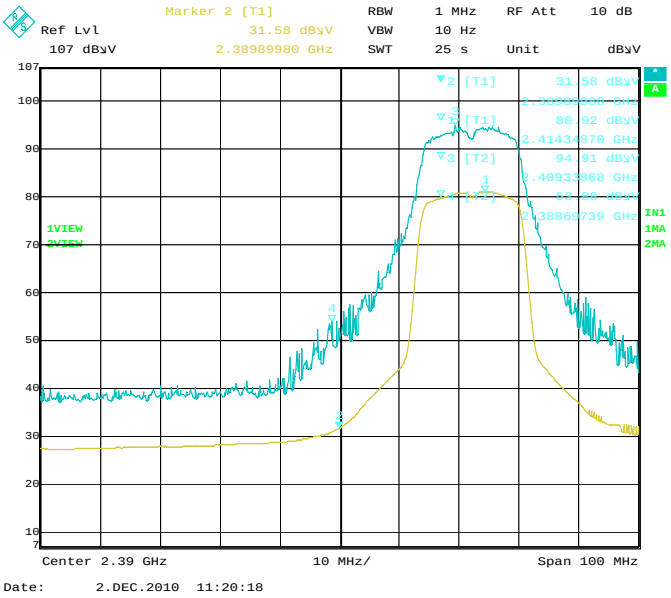



Figure 1-6: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

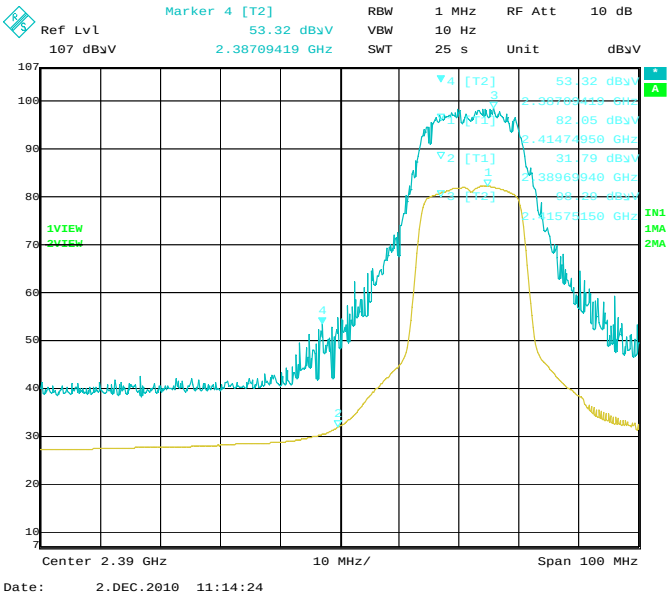



Figure 1-7: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 11, 2480 MHz, Max Pol: V,
Detector: PK

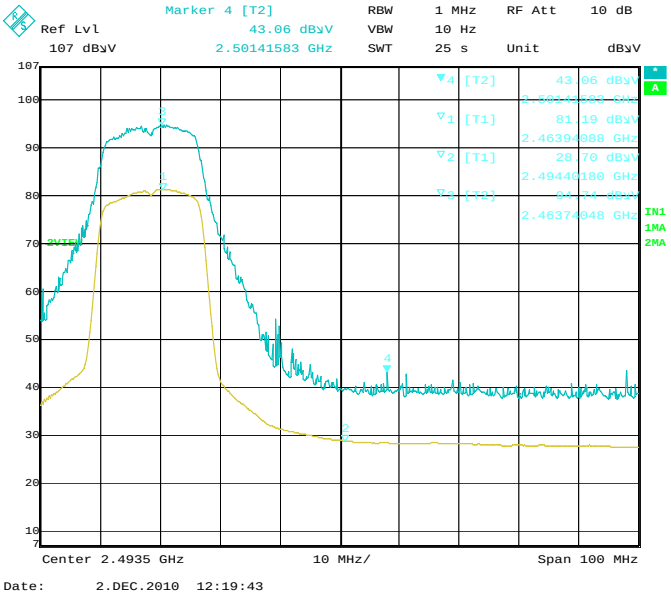



Figure 1-8: Band-Edge Compliance of RF Radiated Emission
802.11g, Channel 11, 2480 MHz, Max Pol: H,
Detector: PK

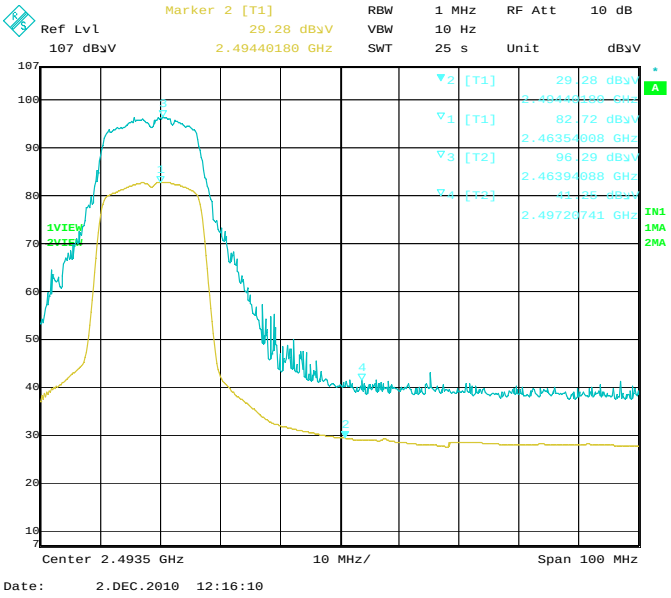


Figure 1-9: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 1, 2412 MHz, Max Pol: V,
Detector: PK

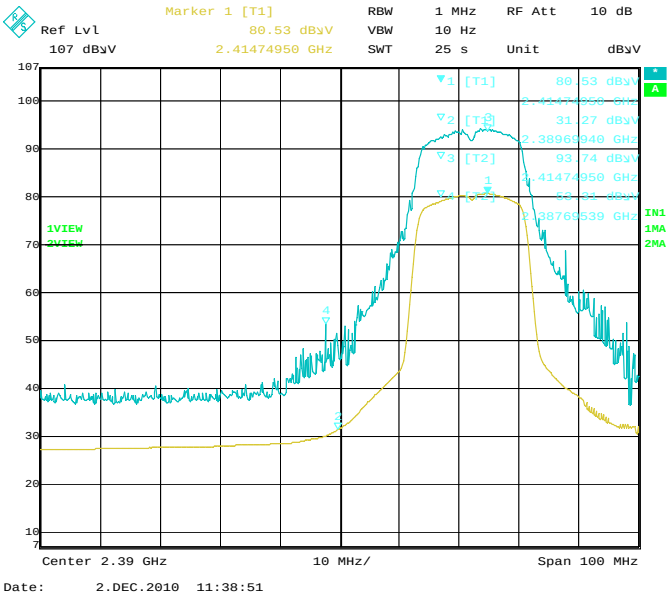



Figure 1-10: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 1, 2412 MHz, Max Pol: H,
Detector: PK

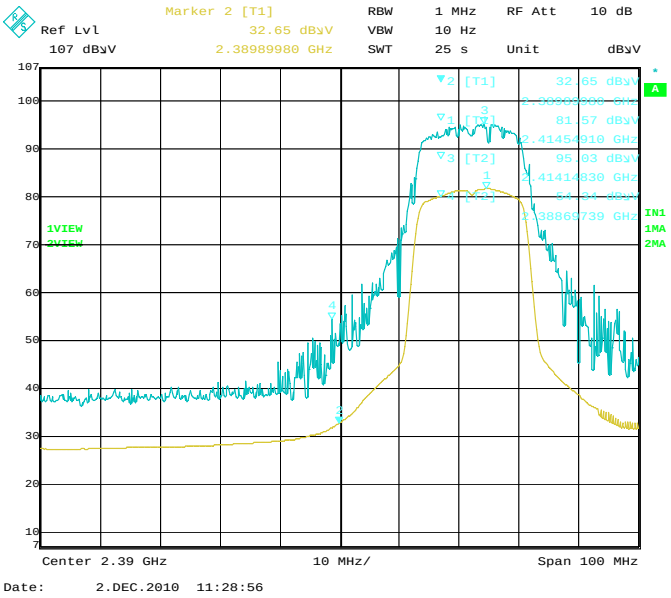



Figure 1-11: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 11, 2480 MHz, Max Pol: V,
Detector: PK

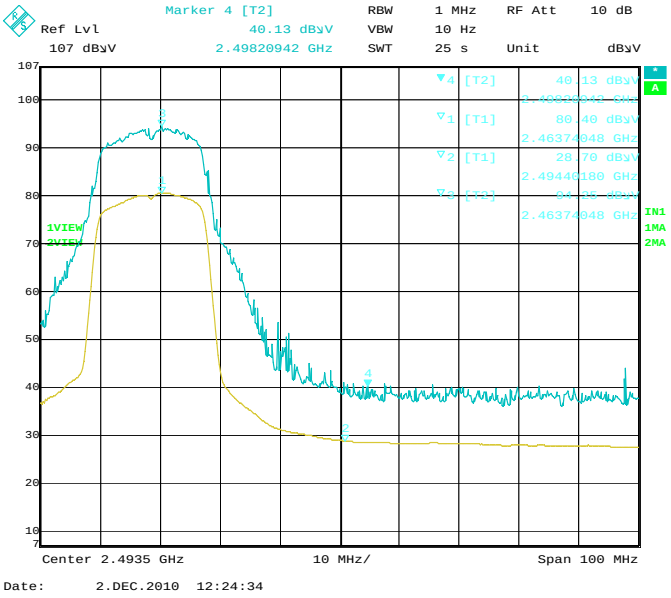



Figure 1-12: Band-Edge Compliance of RF Radiated Emission
802.11n, Channel 11, 2480 MHz, Max Pol: H,
Detector: PK