

**EMC Test Report**  
**Application for Grant of Equipment Authorization**  
**Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8**  
**FCC Part 15 Subpart C**

**Model: SDC-WB40NBT**

IC CERTIFICATION #: 6616A-SDCWB40NBT  
FCC ID: TWG-SDCWB40NBT

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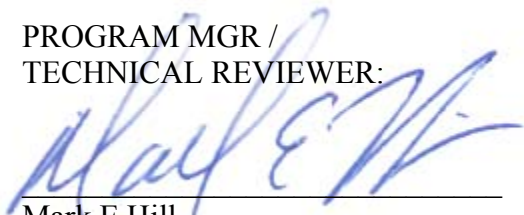
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**REVISION HISTORY**

| Rev# | Date      | Comments      | Modified By |
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## SCOPE

An electromagnetic emissions test has been performed on the Summit Data Communications model SDC-WB40NBT, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3  
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"  
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003  
FHSS test procedure DA 00-0705A1, March 2000

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

## OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

## STATEMENT OF COMPLIANCE

The tested sample of Summit Data Communications model SDC-WB40NBT complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 3  
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"  
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Summit Data Communications model SDC-WB40NBT and therefore apply only to the tested sample. The sample was selected and prepared by Ron Seide of Summit Data Communications.

## DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

**TEST RESULTS SUMMARY****FREQUENCY HOPPING SPREAD SPECTRUM (2400 – 2483.5 MHz)**

| FCC Rule Part                                       | RSS Rule Part           | Description                                       | Measured Value / Comments                                                                               | Limit / Requirement                                     | Result   |
|-----------------------------------------------------|-------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------|
| 15.247 (a) (1)                                      | RSS 210 A8.1 (1)        | 20dB Bandwidth                                    | Basic: 1111kHz<br>EDR: 1470kHz                                                                          | Channel spacing > 2/3rds 20dB BW                        | Complies |
|                                                     |                         | Channel Separation                                | 1000kHz                                                                                                 |                                                         | Complies |
| 15.247 (a) (1) (ii)                                 | RSS 210 A8.1 (4)        | Number of Channels                                | Max: 79<br>Min: 20                                                                                      | 15 or more                                              | Complies |
| 15.247 (a) (1) (ii)                                 | RSS 210 A8.1 (4)        | Channel Dwell Time<br>(average time of occupancy) | The system uses the Bluetooth algorithm and, therefore, meets all requirements for channel utilization. | <0.4 second within a period of 0.4 x number of channels | Complies |
| 15.247 (a) (1)                                      | RSS 210 A8.1 (1)        | Channel Utilization                               |                                                                                                         | All channels shall, on average, be used equally         | Complies |
| 15.247 (b) (3)                                      | RSS 210 A8.4 (2)        | Output Power                                      | Basic: -3.05 dBm (0.5 mW)<br><br>EDR: -1.27 dBm (0.7mW)<br><br>EIRP = 1.2 mW <sup>Note 1</sup>          | 0.125 Watts                                             | Complies |
| 15.247(c)                                           | RSS 210 A8.5            | Spurious Emissions – 30MHz – 25GHz                | All spurious emissions < -20dBc                                                                         | < -20dBc                                                | Complies |
| 15.247(c) / 15.209                                  | RSS 210 A8.5 Table 2, 3 | Radiated Spurious Emissions 30MHz – 25GHz         | 46.5 dBμV/m @ 2994.7 MHz (-7.5 dB)                                                                      | 15.207 in restricted bands, all others < -20dBc         | Complies |
| 15.247 (a) (1)                                      | RSS 210 A8.1(2)         | Receiver bandwidth                                | Refer to operational description                                                                        | Shall match the channel bandwidth                       | Complies |
| Note 1: EIRP calculated using antenna gain of 3 dBi |                         |                                                   |                                                                                                         |                                                         |          |

## GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

| FCC Rule Part                | RSS Rule part            | Description                 | Measured Value / Comments                                                                | Limit / Requirement                            | Result (margin) |
|------------------------------|--------------------------|-----------------------------|------------------------------------------------------------------------------------------|------------------------------------------------|-----------------|
| 15.203                       | -                        | RF Connector                | EUT uses u.FL connectors                                                                 | Unique or integral antenna required            | Complies        |
| 15.207                       | RSS GEN Table 2          | AC Conducted Emissions      | 32.7dB $\mu$ V @ 0.457MHz (-14.1dB)                                                      | Refer to page 18                               | Complies        |
| 15.109                       | RSS GEN 7.2.3 Table 1    | Receiver spurious emissions | 45.0dB $\mu$ V/m @ 2994.7MHz (-9.0dB)                                                    | Refer to page 19                               | Complies        |
| 15.247 (b) (5)<br>15.407 (f) | RSS 102                  | RF Exposure Requirements    | Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements. | Refer to OET 65, FCC Part 1 and RSS 102        | Complies        |
| -                            | RSP 100<br>RSS GEN 7.1.5 | User Manual                 |                                                                                          | Statement required regarding non-interference  | Complies        |
| -                            | RSP 100<br>RSS GEN 7.1.5 | User Manual                 |                                                                                          | Statement for products with detachable antenna | Complies        |
| -                            | RSP 100<br>RSS GEN 4.4.1 | 99% Bandwidth               | Basic: 918kHz<br>EDR: 1223kHz                                                            | Information only                               | N/A             |

**MEASUREMENT UNCERTAINTIES**

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

| Measurement Type                        | Measurement Unit | Frequency Range   | Expanded Uncertainty |
|-----------------------------------------|------------------|-------------------|----------------------|
| RF power, conducted (power meter)       | dBm              | 25 to 7000 MHz    | $\pm 0.52$ dB        |
| RF power, conducted (Spectrum analyzer) | dBm              | 25 to 7000 MHz    | $\pm 0.7$ dB         |
| Conducted emission of transmitter       | dBm              | 25 to 26500 MHz   | $\pm 0.7$ dB         |
| Conducted emission of receiver          | dBm              | 25 to 26500 MHz   | $\pm 0.7$ dB         |
| Radiated emission (substitution method) | dBm              | 25 to 26500 MHz   | $\pm 2.5$ dB         |
| Radiated emission (field strength)      | dB $\mu$ V/m     | 25 to 1000 MHz    | $\pm 3.6$ dB         |
|                                         |                  | 1000 to 40000 MHz | $\pm 6.0$ dB         |
| Conducted Emissions (AC Power)          | dB $\mu$ V       | 0.15 to 30 MHz    | $\pm 2.4$ dB         |



**EQUIPMENT UNDER TEST (EUT) DETAILS****GENERAL**

The Summit Data Communications model SDC-WB40NBT is an 802.11abgn 1x1 with Bluetooth 2.1 module.

The sample was received on October 19, 2010 and tested on October 19, 20 and 21 and November 19 and 24, 2010 and May 11, August 2, 4, 10, 12, 13, 16, 17, 18 19, 20, 23, 24, 26 and October 6, 7, 19, 20 and 26 and November 3, 4, 7, 8, 9, 15, 2011. The EUT consisted of the following component(s):

| Company | Model       | Description           | Serial Number | FCC ID         |
|---------|-------------|-----------------------|---------------|----------------|
| Summit  | SDC-WB40NBT | 802.11abgn 1x with BT | Prototype     | TWG-SDCWB40NBT |

**OTHER EUT DETAILS**

The EUT supports single transmit chain operation.

**ANTENNA SYSTEM**

Monopole Antenna - 2.4 and 5GHz bands - Huber+Suhner, SOA 2459/360/5/0/V\_C, 3dBi (2.4GHz), 6.5dBi (5GHz)

Dipole Antenna #1 - 2.4 and 5GHz bands - Larsen, R380.500.314, 1.6dBi (2.4GHz), 5dBi (5GHz)

Dipole Antenna #2 - 2.4 GHz only - Cisco Air-Ant 4941 2dBi(2.4GHz)

Magnetic Dipole - 2.4GHz and 5GHz bands – Ethertronics, 2.5dBi (2.4GHz), 5dBi (5GHz)

In the 2.4GHz range, the Huber+Suhner (H&S), Cisco and Ethertronics antennas were tested as they represented the highest gain antennas of each available type.

The antenna connects to the EUT via a non-standard u.FL antenna connector, thereby meeting the requirements of FCC 15.203.

**ENCLOSURE**

The EUT has no enclosure. It is designed to be installed within the enclosure of a host computer.

**MODIFICATIONS**

No modifications were made to the EUT during the time the product was at Elliott.

**SUPPORT EQUIPMENT**

The following equipment was used as support equipment for testing:

| Company | Model         | Description                 | Serial Number | FCC ID |
|---------|---------------|-----------------------------|---------------|--------|
| Lenovo  | Inspiron 1545 | Laptop Computer<br>(Note 1) | 953R2K1       | DoC    |
| GME     | GFP181U-A330  | AC/DC Adapter<br>(Note 2)   | 1005-000194   | -      |
| -       | -             | Battery Pack<br>(Note 3)    | -             | -      |

Note 1 - Used to configure the EUT and then disconnected prior to testing

Note 2 – Used for AC conducted emissions only

Note 3 – Used for radiated spurious emissions tests

**EUT INTERFACE PORTS**

The I/O cabling configuration during testing was as follows:

| Port                   | Connected To | Cable(s)    |                        |           |
|------------------------|--------------|-------------|------------------------|-----------|
|                        |              | Description | Shielded or Unshielded | Length(m) |
| AC/DC Adapter – DC out | WB40         | 2wire       | Unshielded             | 1.5m      |
| Battery Pack           | WB40         | 2wire       | Unshielded             | 0.1m      |

**EUT OPERATION**

During testing, the EUT was configured to transmit on a single channel continuously at the maximum power.

**TEST SITE****GENERAL INFORMATION**

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

| Site      | Registration Numbers  |         | Location                                      |
|-----------|-----------------------|---------|-----------------------------------------------|
|           | FCC                   | Canada  |                                               |
| Chamber 3 | 769238                | 2845B-3 | 41039 Boyce Road<br>Fremont,<br>CA 94538-2435 |
| Chamber 4 | 211948                | 2845B-4 |                                               |
| Chamber 5 | 211948                | 2845B-5 |                                               |
| Chamber 7 | A2LA<br>accreditation | 2845B-7 |                                               |

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

**CONDUCTED EMISSIONS CONSIDERATIONS**

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

**RADIATED EMISSIONS CONSIDERATIONS**

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

## MEASUREMENT INSTRUMENTATION

### RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

### INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

### LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

#### *FILTERS/ATTENUATORS*

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

#### *ANTENNAS*

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

#### *ANTENNA MAST AND EQUIPMENT TURNTABLE*

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

#### *INSTRUMENT CALIBRATION*

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

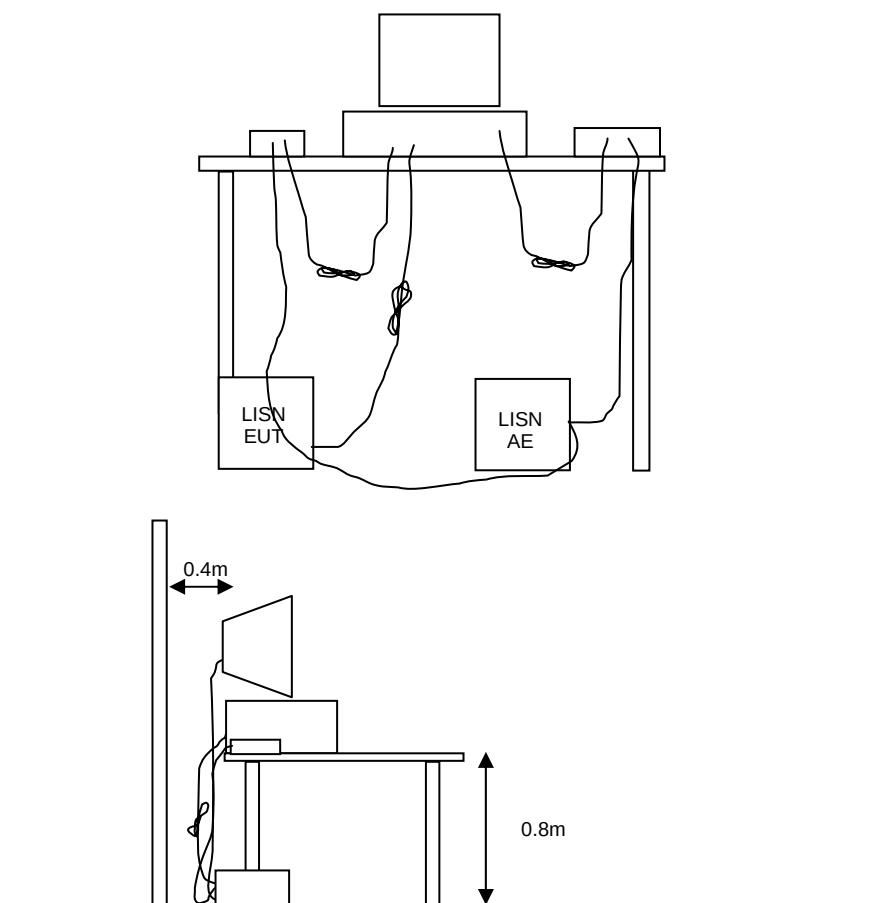
## TEST PROCEDURES

### EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

### CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.



**Figure 1 Typical Conducted Emissions Test Configuration**

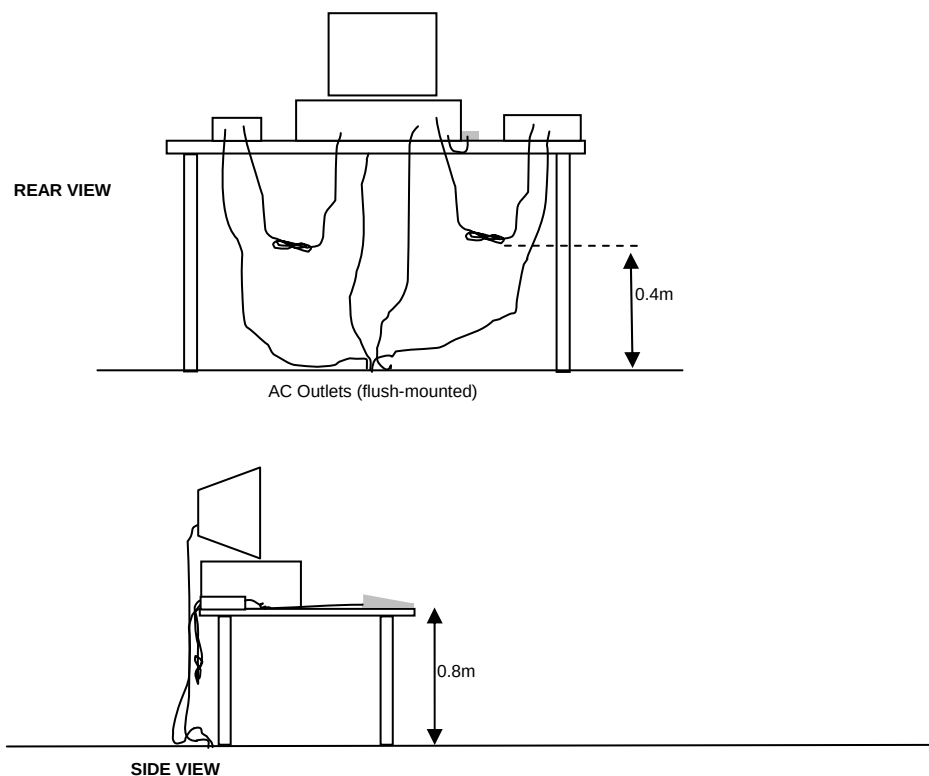
**RADIATED EMISSIONS**

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

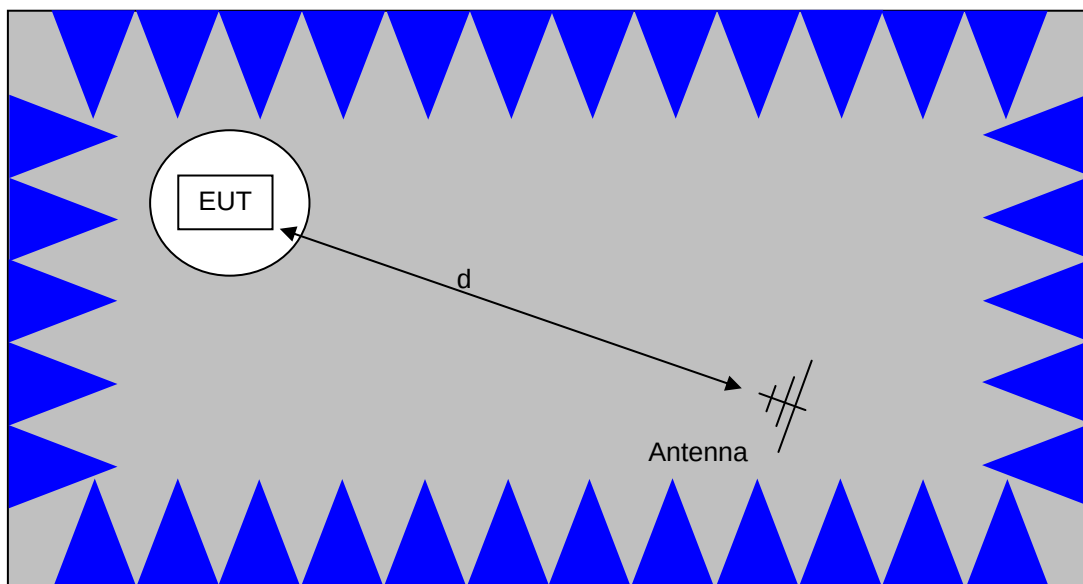
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

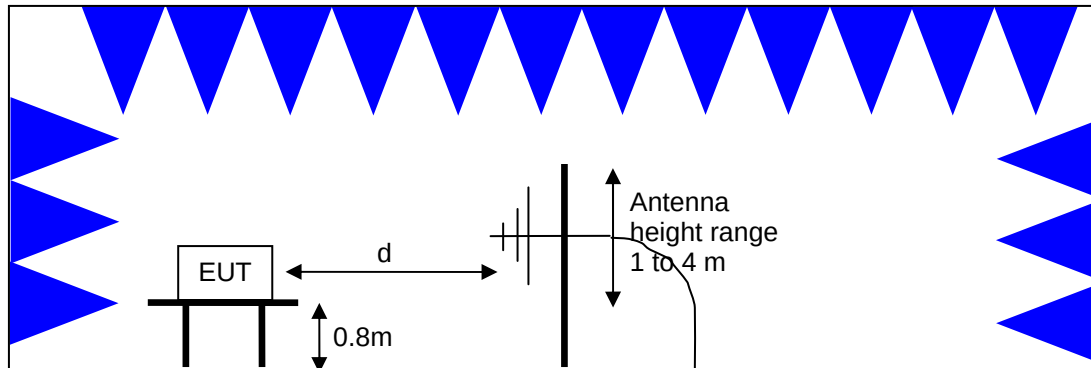


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.

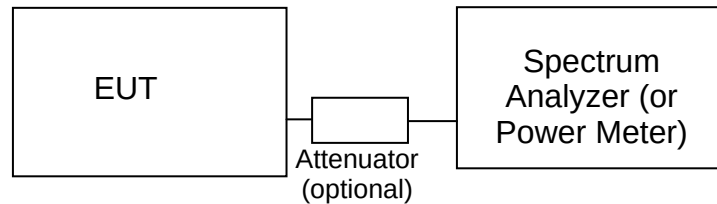


Test Configuration for Radiated Field Strength Measurements  
Semi-Anechoic Chamber, Plan and Side Views



**CONDUCTED EMISSIONS FROM ANTENNA PORT**

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.

**Test Configuration for Antenna Port Measurements**

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and Elliott's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

**BANDWIDTH MEASUREMENTS**

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

**SPECIFICATION LIMITS AND SAMPLE CALCULATIONS**

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

**CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN**

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

| Frequency<br>(MHz) | Average<br>Limit<br>(dBuV)                                                   | Quasi Peak<br>Limit<br>(dBuV)                                                |
|--------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 0.150 to 0.500     | Linear decrease on<br>logarithmic frequency<br>axis<br>between 56.0 and 46.0 | Linear decrease on<br>logarithmic frequency<br>axis<br>between 66.0 and 56.0 |
| 0.500 to 5.000     | 46.0                                                                         | 56.0                                                                         |
| 5.000 to 30.000    | 50.0                                                                         | 60.0                                                                         |

**GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS**

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands<sup>1</sup> (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

| Frequency Range (MHz) | Limit (uV/m)                 | Limit (dBuV/m @ 3m)                                  |
|-----------------------|------------------------------|------------------------------------------------------|
| 0.009-0.490           | 2400/F <sub>KHz</sub> @ 300m | 67.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 300m |
| 0.490-1.705           | 24000/F <sub>KHz</sub> @ 30m | 87.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 30m  |
| 1.705 to 30           | 30 @ 30m                     | 29.5 @ 30m                                           |
| 30 to 88              | 100 @ 3m                     | 40 @ 3m                                              |
| 88 to 216             | 150 @ 3m                     | 43.5 @ 3m                                            |
| 216 to 960            | 200 @ 3m                     | 46.0 @ 3m                                            |
| Above 960             | 500 @ 3m                     | 54.0 @ 3m                                            |

**RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS**

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

| Frequency Range (MHz) | Limit (uV/m @ 3m) | Limit (dBuV/m @ 3m) |
|-----------------------|-------------------|---------------------|
| 30 to 88              | 100               | 40                  |
| 88 to 216             | 150               | 43.5                |
| 216 to 960            | 200               | 46.0                |
| Above 960             | 500               | 54.0                |

<sup>1</sup> The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

*OUTPUT POWER LIMITS – FHSS SYSTEMS*

The table below shows the limits for output power based on the number of channels available for the hopping system.

| Operating Frequency (MHz) | Number of Channels | Output Power         |
|---------------------------|--------------------|----------------------|
| 902 – 928                 | $\geq 50$          | 1 Watt (30 dBm)      |
| 902 – 928                 | 25 to 49           | 0.25 Watts (24 dBm)  |
| 2400 – 2483.5             | $\geq 75$          | 1 Watt (30 dBm)      |
| 2400 – 2483.5             | $< 75$             | 0.125 Watts (21 dBm) |
| 5725 – 5850               | 75                 | 1 Watt (30 dBm)      |

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

*TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS*

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

*SAMPLE CALCULATIONS - CONDUCTED EMISSIONS*

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

$R_r$  = Receiver Reading in dBuV

$S$  = Specification Limit in dBuV

$M$  = Margin to Specification in +/- dB

---

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

$$F_d = \text{Distance Factor in dB}$$

$$D_m = \text{Measurement Distance in meters}$$

$$D_s = \text{Specification Distance in meters}$$

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

---

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{d} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

**Appendix A Test Equipment Calibration Data****Radiated Emissions, 30 - 1,000 MHz, 11-May-11**

| <u>Manufacturer</u> | <u>Description</u>                    | <u>Model</u> | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|---------------------------------------|--------------|----------------|----------------|
| Hewlett Packard     | EMC Spectrum Analyzer, 9 KHz - 22 GHz | 8593EM       | 1319           | 11/22/2011     |
| Rohde & Schwarz     | Test Receiver, 0.009-2750 MHz         | ESN          | 1332           | 1/17/2012      |
| Sunol Sciences      | Biconilog, 30-3000 MHz                | JB3          | 1549           | 6/4/2011       |
| Com-Power Corp.     | Preamplifier, 30-1000 MHz             | PA-103A      | 2359           | 2/15/2012      |

**Conducted Emissions - AC Power Ports, 11-May-11**

| <u>Manufacturer</u> | <u>Description</u>                    | <u>Model</u>        | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|---------------------------------------|---------------------|----------------|----------------|
| Hewlett Packard     | EMC Spectrum Analyzer, 9 KHz - 22 GHz | 8593EM              | 1319           | 11/22/2011     |
| Rohde & Schwarz     | Test Receiver, 0.009-2750 MHz         | ESN                 | 1332           | 1/17/2012      |
| Rohde & Schwarz     | Pulse Limiter                         | ESH3 Z2             | 1594           | 5/27/2011      |
| Fischer Custom Comm | LISN, 25A, 150kHz to 30MHz, 25 Amp,   | FCC-LISN-50-25-2-09 | 2000           | 12/15/2011     |

**Radiated Emissions, 30 - 6,500 MHz, 06-Oct-11**

| <u>Manufacturer</u> | <u>Description</u>                  | <u>Model</u>   | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|-------------------------------------|----------------|----------------|----------------|
| Hewlett Packard     | Microwave Preamplifier, 1-26.5GHz   | 8449B          | 263            | 12/8/2011      |
| EMCO                | Antenna, Horn, 1-18 GHz (SA40-Red)  | 3115           | 1142           | 8/2/2012       |
| Hewlett Packard     | SpecAn 30 Hz -40 GHz, SV (SA40) Red | 8564E (84125C) | 1148           | 8/15/2012      |

**Radiated Emissions, 1000 - 26,500 MHz, 07-Oct-11**

| <u>Manufacturer</u> | <u>Description</u>                  | <u>Model</u>   | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|-------------------------------------|----------------|----------------|----------------|
| Hewlett Packard     | Microwave Preamplifier, 1-26.5GHz   | 8449B          | 263            | 12/8/2011      |
| EMCO                | Antenna, Horn, 1-18 GHz (SA40-Red)  | 3115           | 1142           | 8/2/2012       |
| Hewlett Packard     | SpecAn 30 Hz -40 GHz, SV (SA40) Red | 8564E (84125C) | 1148           | 8/15/2012      |
| Micro-Tronics       | Band Reject Filter, 2400-2500 MHz   | BRM50702-02    | 1683           | 8/3/2012       |

**Radio Antenna Port (Power and Spurious Emissions), 19-Oct-11**

| <u>Manufacturer</u> | <u>Description</u>                  | <u>Model</u>   | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|-------------------------------------|----------------|----------------|----------------|
| Hewlett Packard     | SpecAn 30 Hz -40 GHz, SV (SA40) Red | 8564E (84125C) | 1148           | 8/15/2012      |

**Radiated Emissions, 1000 - 26,500 MHz, 20-Oct-11**

| <u>Manufacturer</u> | <u>Description</u>                    | <u>Model</u>       | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|---------------------------------------|--------------------|----------------|----------------|
| Hewlett Packard     | Microwave Preamplifier, 1-26.5GHz     | 8449B              | 263            | 12/8/2011      |
| Hewlett Packard     | Head (Inc flex cable, 1143, 2198) Red | 84125C             | 1145           | 2/17/2012      |
| Hewlett Packard     | SpecAn 30 Hz -40 GHz, SV (SA40) Red   | 8564E (84125C)     | 1148           | 8/15/2012      |
| EMCO                | Antenna, Horn, 1-18 GHz               | 3115               | 1561           | 6/22/2012      |
| Micro-Tronics       | Band Reject Filter, 2400-2500 MHz     | BRM50702-02        | 1683           | 8/3/2012       |
| A.H. Systems        | Purple System Horn, 18-40GHz          | SAS-574, p/n: 2581 | 2160           | 2/9/2012       |

**Radiated Emissions, 1000 - 26,500 MHz, 26-Oct-11**

| <u>Manufacturer</u> | <u>Description</u>                  | <u>Model</u>   | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|-------------------------------------|----------------|----------------|----------------|
| Hewlett Packard     | Microwave Preamplifier, 1-26.5GHz   | 8449B          | 263            | 12/8/2011      |
| EMCO                | Antenna, Horn, 1-18 GHz             | 3115           | 487            | 7/6/2012       |
| Hewlett Packard     | SpecAn 30 Hz -40 GHz, SV (SA40) Red | 8564E (84125C) | 1148           | 8/15/2012      |

**Conducted Emissions - AC Power Ports, 16-Dec-11**

| <u>Manufacturer</u> | <u>Description</u>             | <u>Model</u> | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|--------------------------------|--------------|----------------|----------------|
| EMCO                | LISN, 10 kHz-100 MHz, 25A      | 3825/2       | 1292           | 3/1/2012       |
| Rohde & Schwarz     | EMI Test Receiver, 20 Hz-7 GHz | ESIB7        | 1756           | 4/6/2012       |



## *Appendix B Test Data*

T83113 Pages 26 – 92

T83198 Pages 93 - 101

|                        |                                      |                  |                   |
|------------------------|--------------------------------------|------------------|-------------------|
| Client:                | Summit Data Communications           | Job Number:      | J78403            |
| Model:                 | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
|                        |                                      | Account Manager: | Christine Krebill |
| Contact:               | Ron Seide                            |                  | -                 |
| Emissions Standard(s): | FCC 15.247/RSS-210                   | Class:           | -                 |
| Immunity Standard(s):  | EN 301 489-1 V1.8.1                  | Environment:     | -                 |

## EMC Test Data

For The

### Summit Data Communications

Model

SDC-WB40NBT (1x1 802.11abg + BT 2.1)

Date of Last Test:

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100m period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                      | Channel | Antenna          | Power Setting | Test Performed                        | Limit  | Result / Margin                     |
|---------|---------------------------|---------|------------------|---------------|---------------------------------------|--------|-------------------------------------|
| Run # 1 | Basic (1 Mb/s)<br>Chain A | 2402MHz | Ethertronic<br>s | max           | Restricted Band Edge<br>at 2390 MHz   | 15.209 | 38.6dBμV/m @<br>2350.1MHz (-15.4dB) |
|         |                           | 2480MHz | Ethertronic<br>s | max           | Restricted Band Edge<br>at 2483.5 MHz | 15.209 | 39.5dBμV/m @<br>2483.5MHz (-14.5dB) |
| Run # 2 | EDR (3 Mb/s)<br>Chain A   | 2402MHz | Ethertronic<br>s | max           | Restricted Band Edge<br>at 2390 MHz   | 15.209 | 38.6dBμV/m @<br>2389.8MHz (-15.4dB) |
|         |                           | 2480MHz | Ethertronic<br>s | max           | Restricted Band Edge<br>at 2483.5 MHz | 15.209 | 40.1dBμV/m @<br>2483.5MHz (-13.9dB) |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:                      Temperature:      20-25 °C  
                                                         Rel. Humidity:      40-50 %

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

Run # 1, Band Edge Field Strength - Basic (1 Mb/s), Chain A

Date of Test: 10/19/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#5

Config Change: none

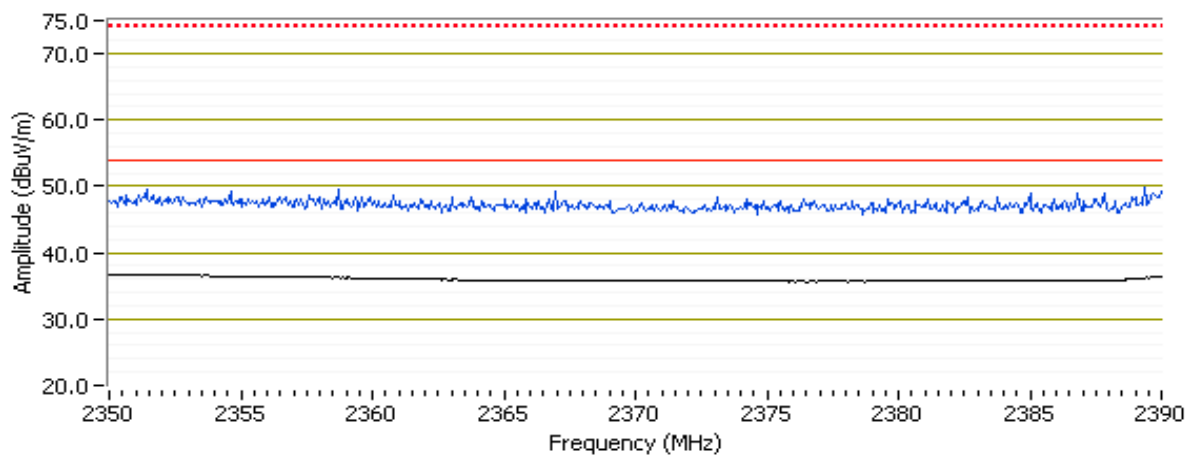
Run # 1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

## 2390 MHz Band Edge Signal Field Strength

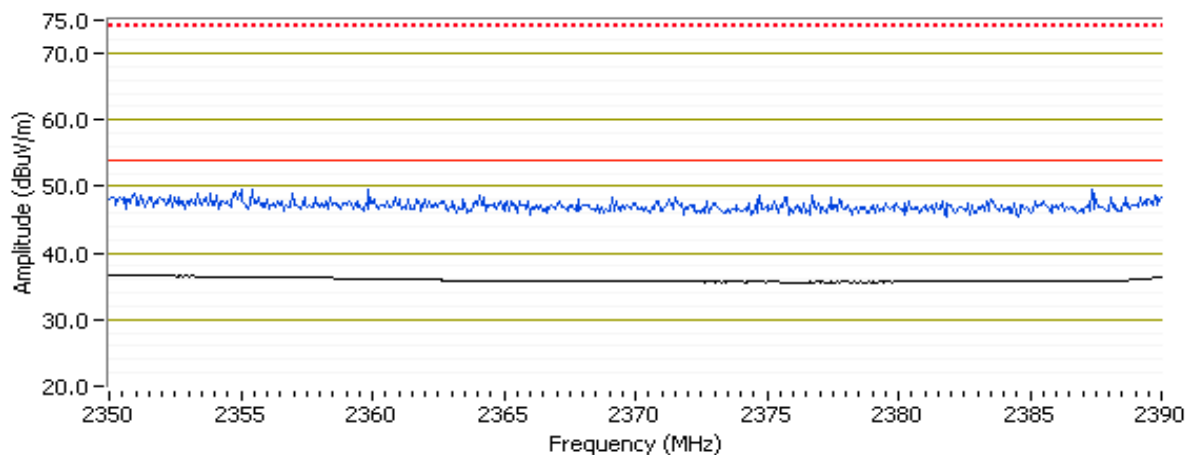
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2350.130  | 38.6         | V   | 54.0            | -15.4  | AVG       | 283     | 1.4    | RB 1 MHz;VB 10 Hz;Pk |
| 2389.870  | 49.6         | V   | 74.0            | -24.4  | PK        | 283     | 1.4    | RB 1 MHz;VB 3 MHz;Pk |
| 2352.070  | 38.6         | H   | 54.0            | -15.4  | AVG       | 204     | 1.2    | RB 1 MHz;VB 10 Hz;Pk |
| 2383.530  | 49.9         | H   | 74.0            | -24.1  | PK        | 204     | 1.2    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg(black) 1MHz=RV=VB=Pk (blue) vertical



RB 1 MHz; VB 10 Hz = avg(black) 1MHz=RV=VB=Pk (blue) horizontal



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

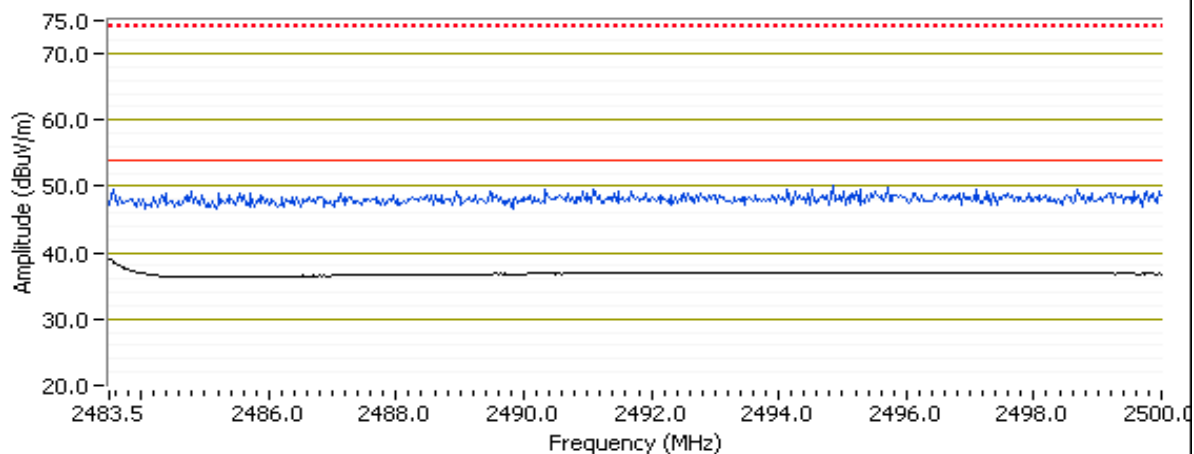
Run # 1b, EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

## 2483.5 MHz Band Edge Signal Radiated Field Strength

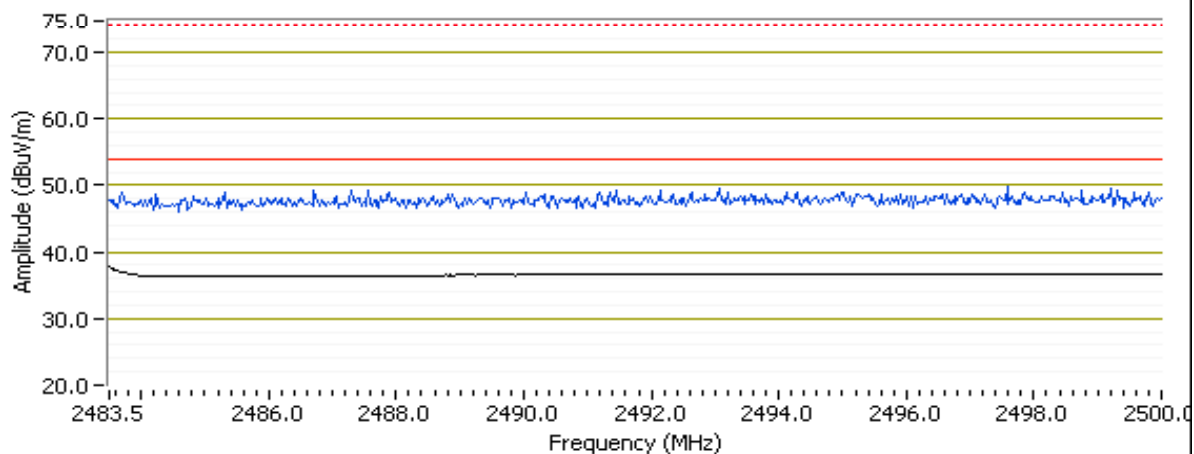
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 39.5         | H   | 54.0            | -14.5  | AVG       | 15      | 1.1    | RB 1 MHz;VB 10 Hz;Pk |
| 2496.040  | 50.8         | H   | 74.0            | -23.2  | PK        | 15      | 1.1    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 38.8         | V   | 54.0            | -15.2  | AVG       | 268     | 1.1    | RB 1 MHz;VB 10 Hz;Pk |
| 2498.930  | 49.9         | V   | 74.0            | -24.1  | PK        | 268     | 1.1    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) horizontal



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2, Band Edge Field Strength - EDR (3 Mb/s), Chain A

Date of Test: 10/19/2011

Test Engineer: Rafael Varelas

Test Location: FT Chamber #5

Config Change: None

Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

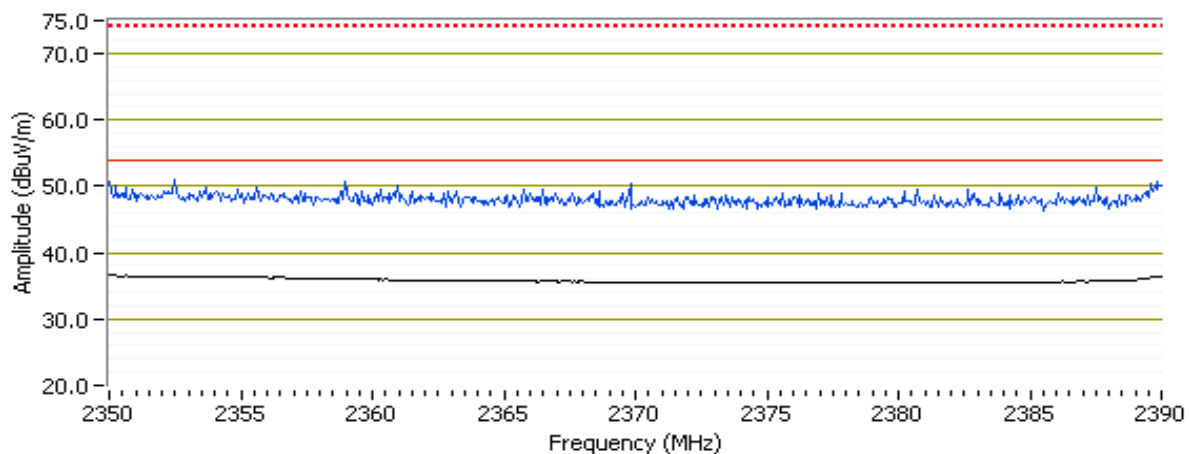
## 2390 MHz Band Edge Signal Field Strength

| Frequency | Level  | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dBμV/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2389.800  | 38.6   | V   | 54.0            | -15.4  | AVG       | 290     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2389.690  | 50.5   | V   | 74.0            | -23.5  | PK        | 290     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2389.980  | 38.5   | H   | 54.0            | -15.5  | AVG       | 205     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2389.380  | 51.0   | H   | 74.0            | -23.0  | PK        | 205     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

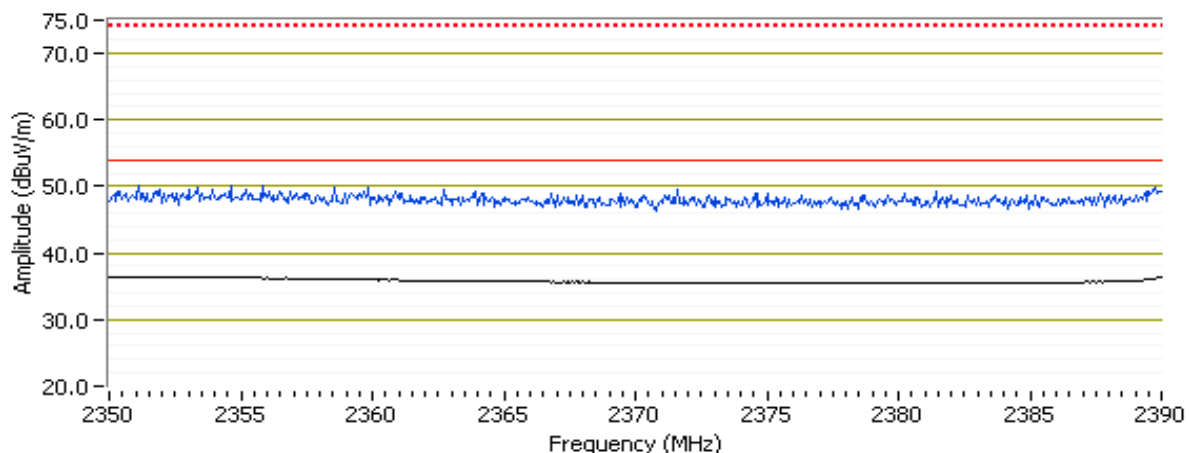


|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) Vertical



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) Horizontal



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

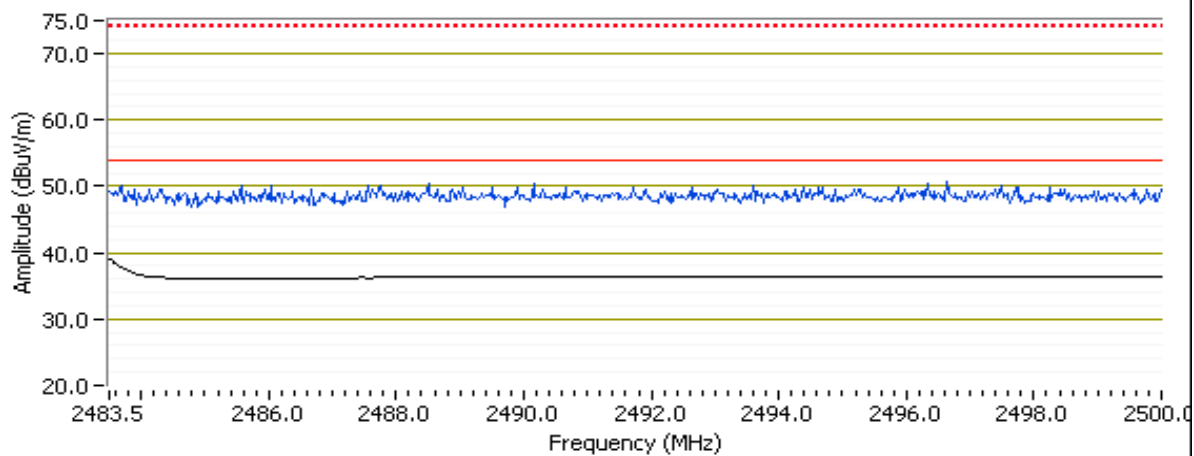
Run # 2b, EUT on Channel 2480MHz - EDR (3 Mb/s), Chain A

## 2483.5 MHz Band Edge Signal Radiated Field Strength

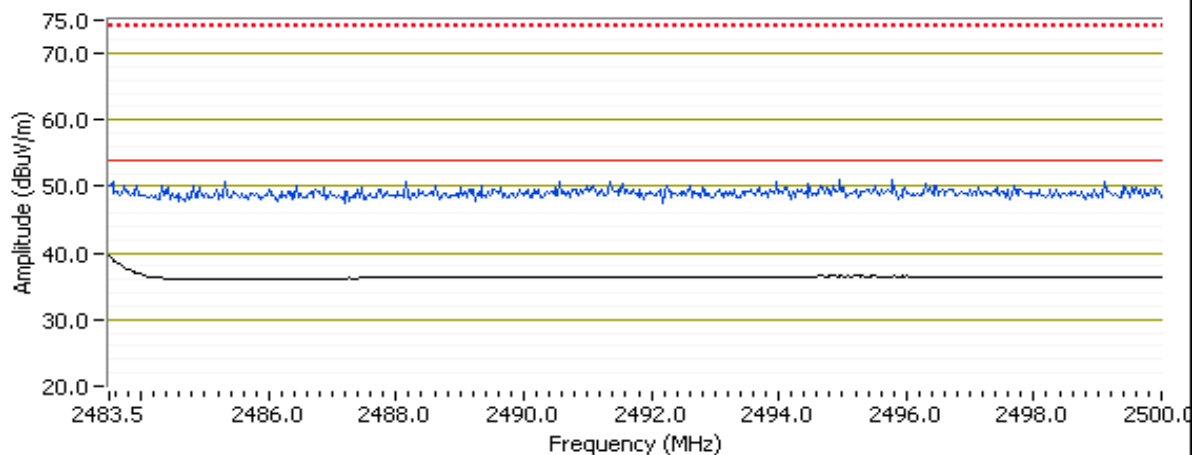
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 40.1         | H   | 54.0            | -13.9  | AVG       | 21      | 1.1    | RB 1 MHz;VB 10 Hz;Pk |
| 2485.410  | 49.9         | H   | 74.0            | -24.1  | PK        | 21      | 1.1    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 39.6         | V   | 54.0            | -14.4  | AVG       | 286     | 1.1    | RB 1 MHz;VB 10 Hz;Pk |
| 2486.110  | 49.6         | V   | 74.0            | -24.4  | PK        | 286     | 1.1    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) Vertical



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) Horizontal



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100m period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                      | Channel | Antenna | Power Setting | Test Performed                     | Limit  | Result / Margin                  |
|---------|---------------------------|---------|---------|---------------|------------------------------------|--------|----------------------------------|
| Run # 1 | Basic (1 Mb/s)<br>Chain A | 2402MHz | Cisco   | max           | Restricted Band Edge at 2390 MHz   | 15.209 | 39.5dBμV/m @ 2390.0MHz (-14.5dB) |
|         |                           | 2480MHz | Cisco   | max           | Restricted Band Edge at 2483.5 MHz | 15.209 | 42.2dBμV/m @ 2483.5MHz (-11.8dB) |
| Run # 2 | EDR (3 Mb/s)<br>Chain A   | 2402MHz | Cisco   | max           | Restricted Band Edge at 2390 MHz   | 15.209 | 39.5dBμV/m @ 2389.9MHz (-14.5dB) |
|         |                           | 2480MHz | Cisco   | max           | Restricted Band Edge at 2483.5 MHz | 15.209 | 43.6dBμV/m @ 2483.5MHz (-10.4dB) |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:                      Temperature:      20-25 °C  
                                                         Rel. Humidity:      40-50 %

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## Run # 1, Band Edge Field Strength - Basic (1 Mb/s), Chain A

Date of Test: 10/5/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#3

Config Change: none

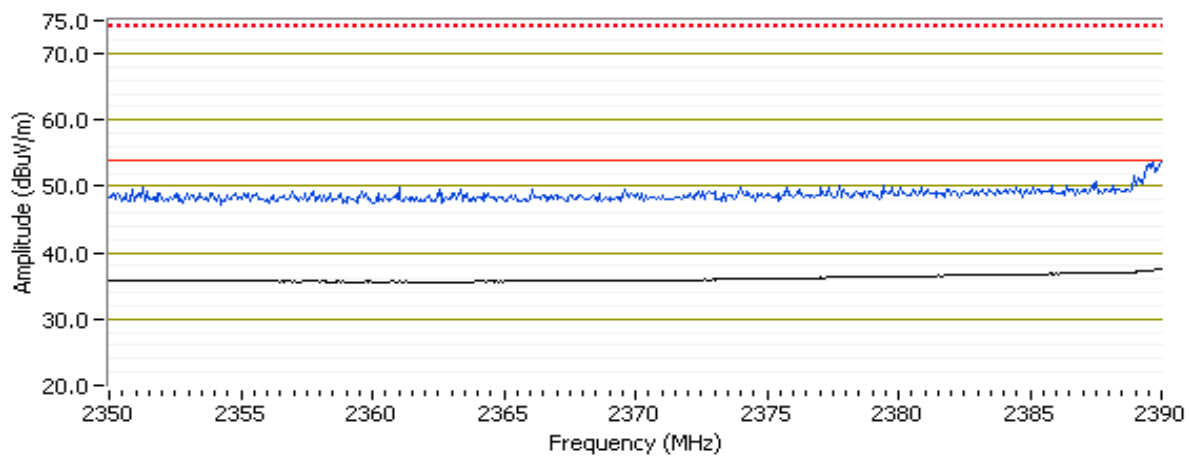
## Run # 1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

## 2390 MHz Band Edge Signal Field Strength

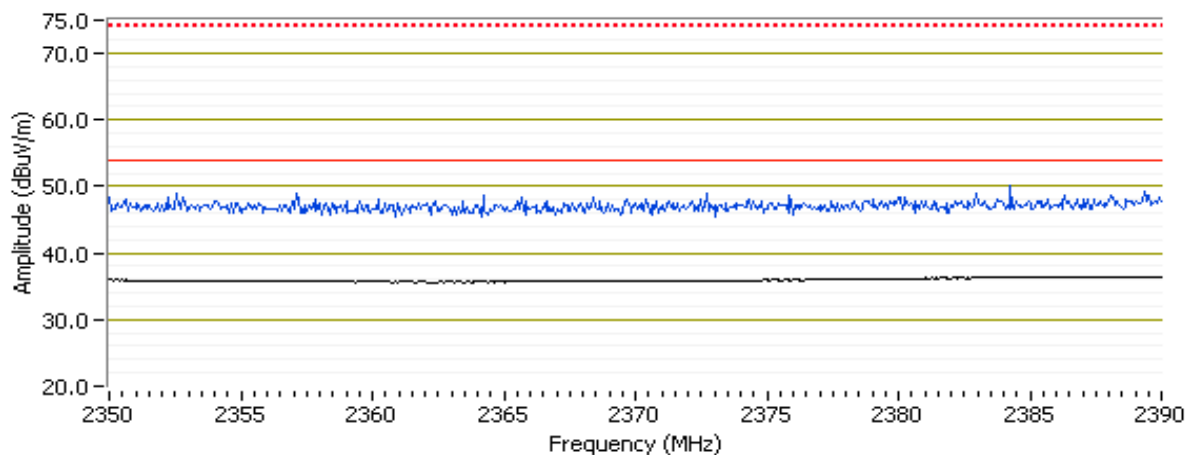
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2390.000  | 39.5         | V   | 54.0            | -14.5  | AVG       | 360     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2389.800  | 51.1         | V   | 74.0            | -22.9  | PK        | 360     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2389.200  | 38.3         | H   | 54.0            | -15.7  | AVG       | 132     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2374.670  | 49.7         | H   | 74.0            | -24.3  | PK        | 132     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) horizontal



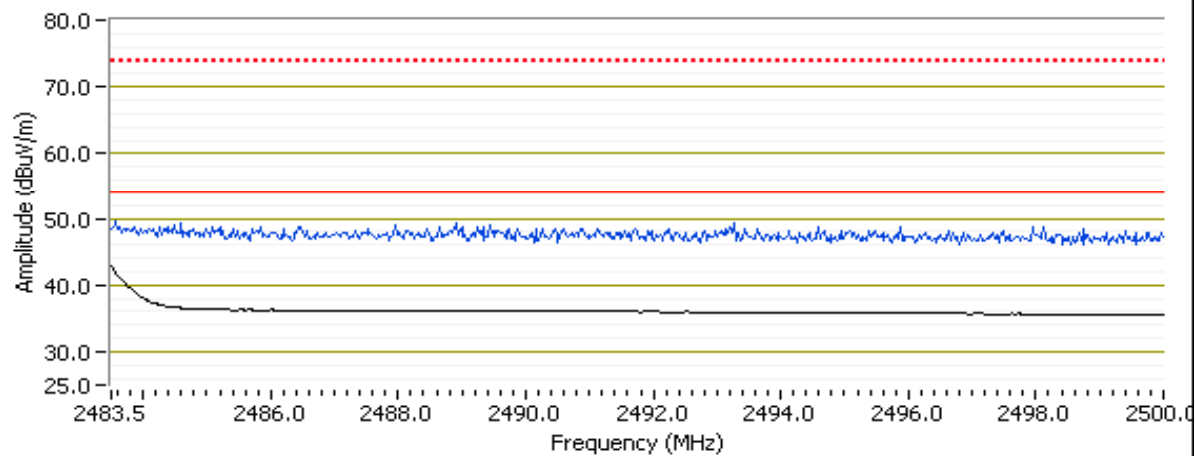
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 1b, EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

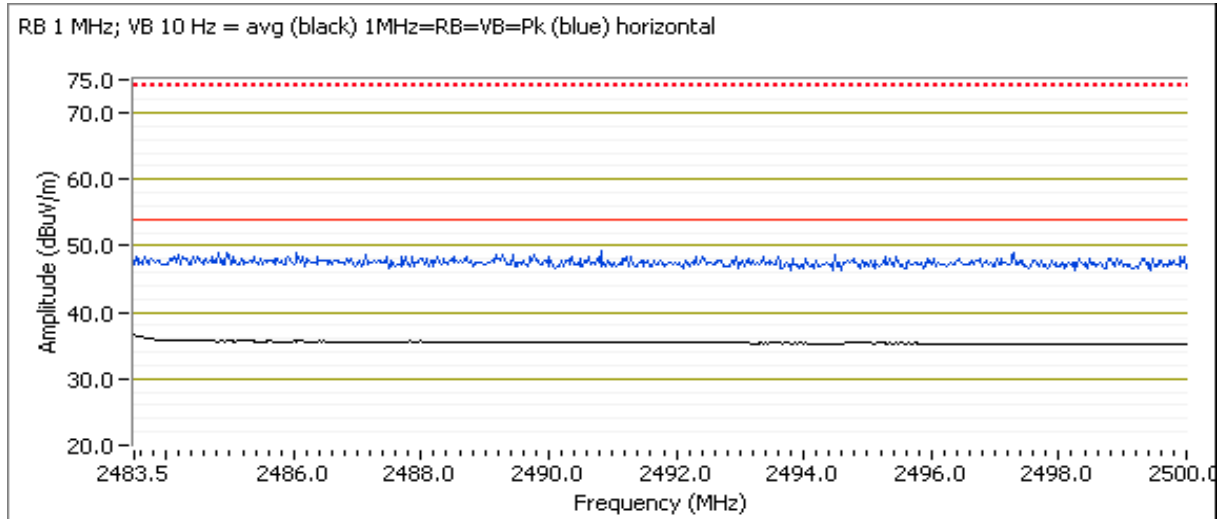
## 2483.5 MHz Band Edge Signal Radiated Field Strength

| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 42.2         | V   | 54.0            | -11.8  | AVG       | 343     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2484.300  | 49.2         | V   | 74.0            | -24.8  | PK        | 343     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 37.9         | H   | 54.0            | -16.1  | AVG       | 185     | 1.1    | RB 1 MHz;VB 10 Hz;Pk |
| 2489.550  | 48.7         | H   | 74.0            | -25.3  | PK        | 185     | 1.1    | RB 1 MHz;VB 3 MHz;Pk |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



Run # 2, Band Edge Field Strength - EDR (3 Mb/s), Chain A

Date of Test: 10/5/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#3

Config Change: none

Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

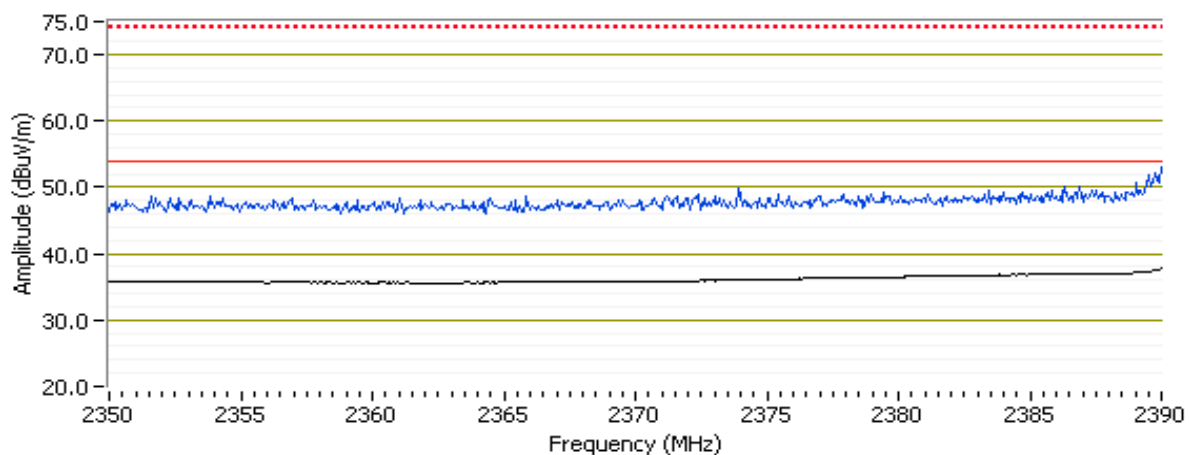
## 2390 MHz Band Edge Signal Field Strength

| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2389.930  | 39.5         | V   | 54.0            | -14.5  | AVG       | 0       | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2389.600  | 50.7         | V   | 74.0            | -23.3  | PK        | 0       | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2387.670  | 38.1         | H   | 54.0            | -15.9  | AVG       | 0       | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2356.930  | 49.6         | H   | 74.0            | -24.4  | PK        | 0       | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

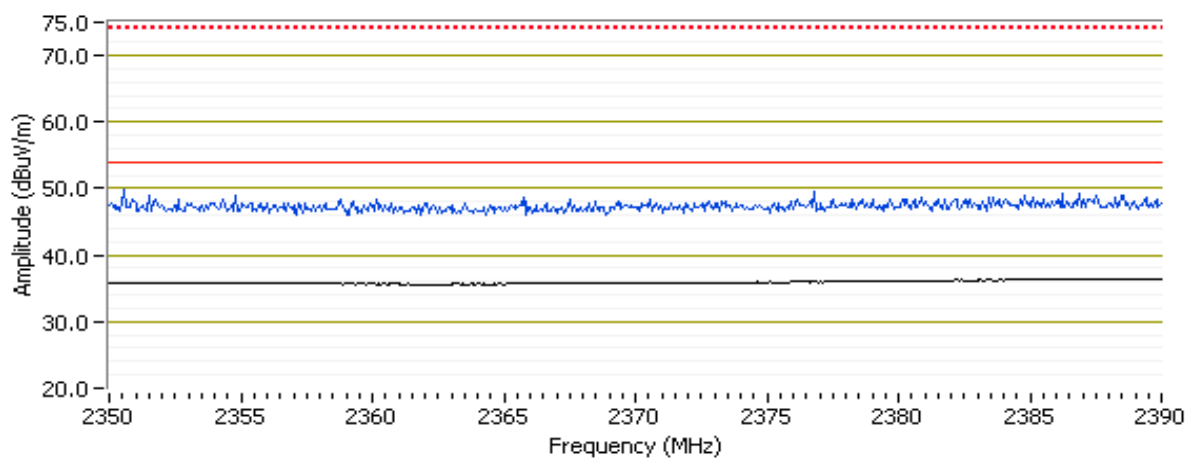


|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) horizontal



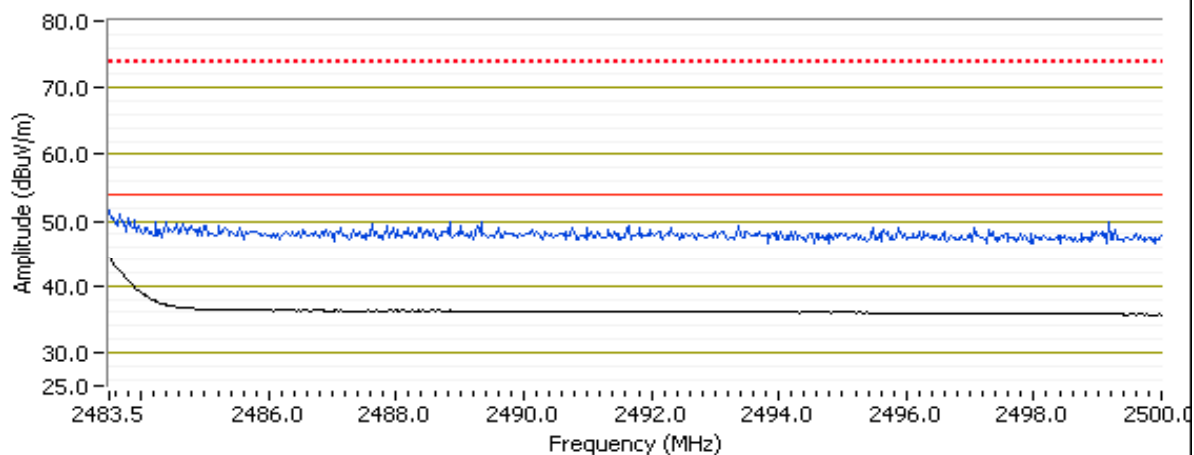
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2b, EUT on Channel 2480MHz - EDR (3 Mb/s), Chain A

## 2483.5 MHz Band Edge Signal Radiated Field Strength

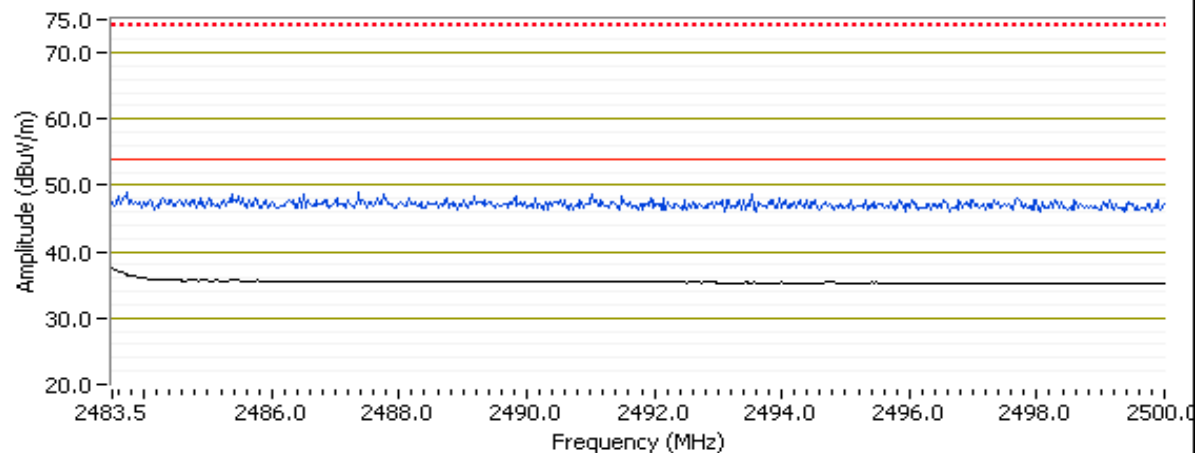
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 43.6         | V   | 54.0            | -10.4  | AVG       | 100     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2483.580  | 50.2         | V   | 74.0            | -23.8  | PK        | 100     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 38.4         | H   | 54.0            | -15.6  | AVG       | 187     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2497.440  | 49.0         | H   | 74.0            | -25.0  | PK        | 187     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) horizontal



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100ms period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$ .

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                      | Channel | Antenna | Power Setting | Test Performed                     | Limit  | Result / Margin                  |
|---------|---------------------------|---------|---------|---------------|------------------------------------|--------|----------------------------------|
| Run # 1 | Basic (1 Mb/s)<br>Chain A | 2402MHz | H&S     | max           | Restricted Band Edge at 2390 MHz   | 15.209 | 39.4dBμV/m @ 2390.0MHz (-14.6dB) |
|         |                           | 2480MHz | H&S     | max           | Restricted Band Edge at 2483.5 MHz | 15.209 | 42.8dBμV/m @ 2483.5MHz (-11.2dB) |
| Run # 2 | EDR (3 Mb/s)<br>Chain A   | 2402MHz | H&S     | max           | Restricted Band Edge at 2390 MHz   | 15.209 | 38.7dBμV/m @ 2387.9MHz (-15.3dB) |
|         |                           | 2480MHz | H&S     | max           | Restricted Band Edge at 2483.5 MHz | 15.209 | 43.7dBμV/m @ 2483.5MHz (-10.3dB) |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:                      Temperature:      20-25 °C  
                                                         Rel. Humidity:      40-50 %

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## Run # 1, Band Edge Field Strength - Basic (1 Mb/s), Chain A

Date of Test: 10/7/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chmaber#4

Config Change: none

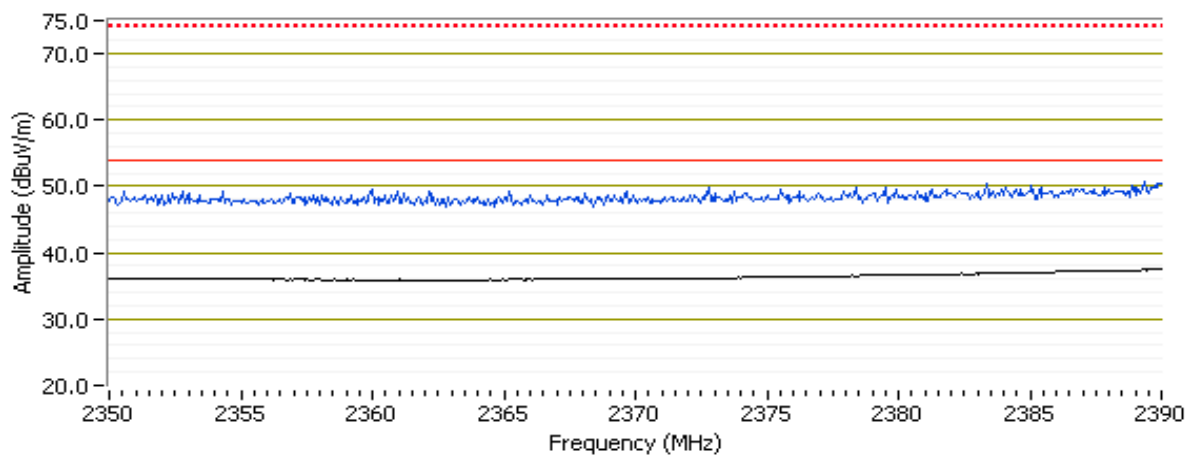
## Run # 1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

### 2390 MHz Band Edge Signal Field Strength

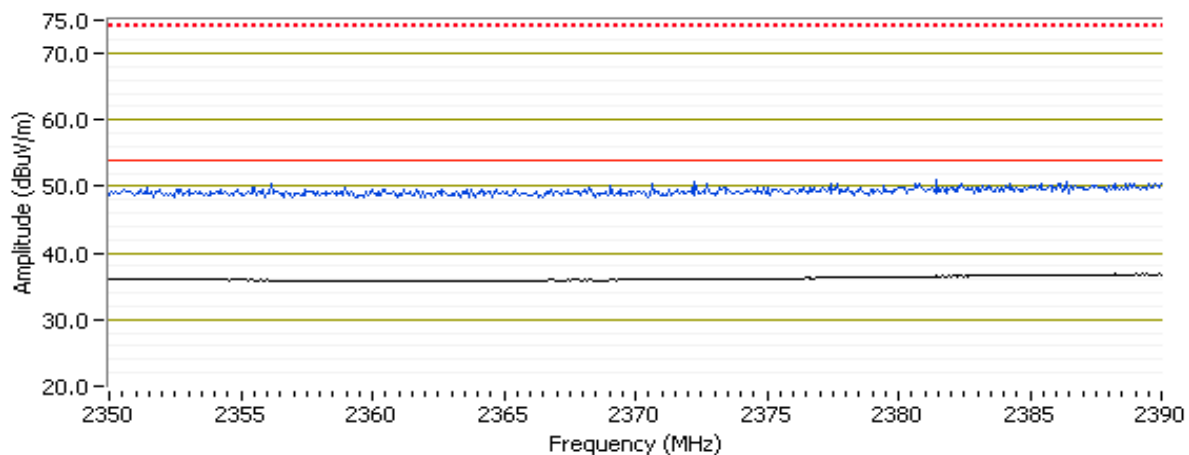
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2390.000  | 39.4         | V   | 54.0            | -14.6  | AVG       | 235     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2386.400  | 50.7         | V   | 74.0            | -23.3  | PK        | 235     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2388.130  | 38.7         | H   | 54.0            | -15.3  | AVG       | 67      | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2378.800  | 49.8         | H   | 74.0            | -24.2  | PK        | 67      | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (Black) 1MHz=RB=VB=Pk (blue) vertical



RB 1 MHz; VB 10 Hz = avg (Black) 1MHz=RB=VB=Pk (blue) horizontal



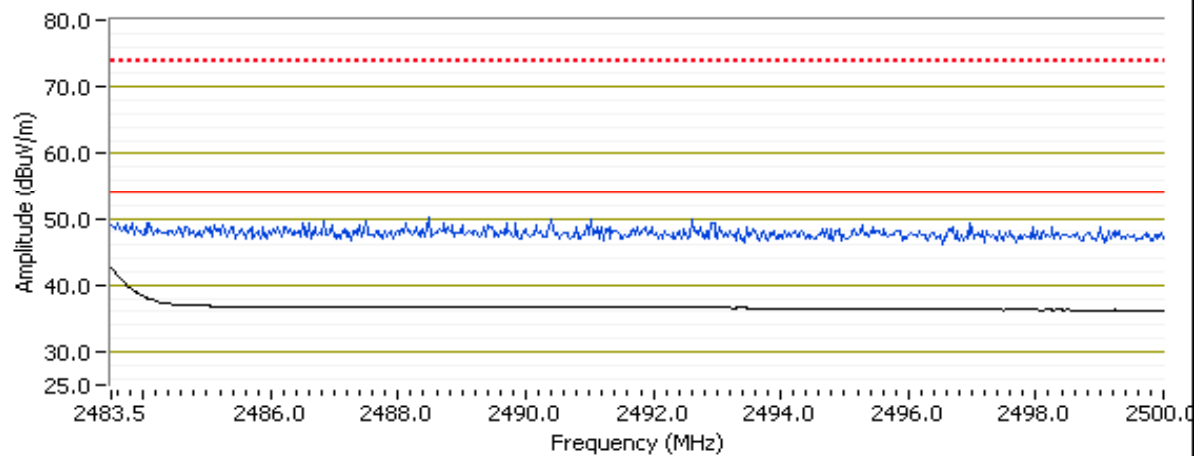
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 1b, EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

## 2483.5 MHz Band Edge Signal Radiated Field Strength

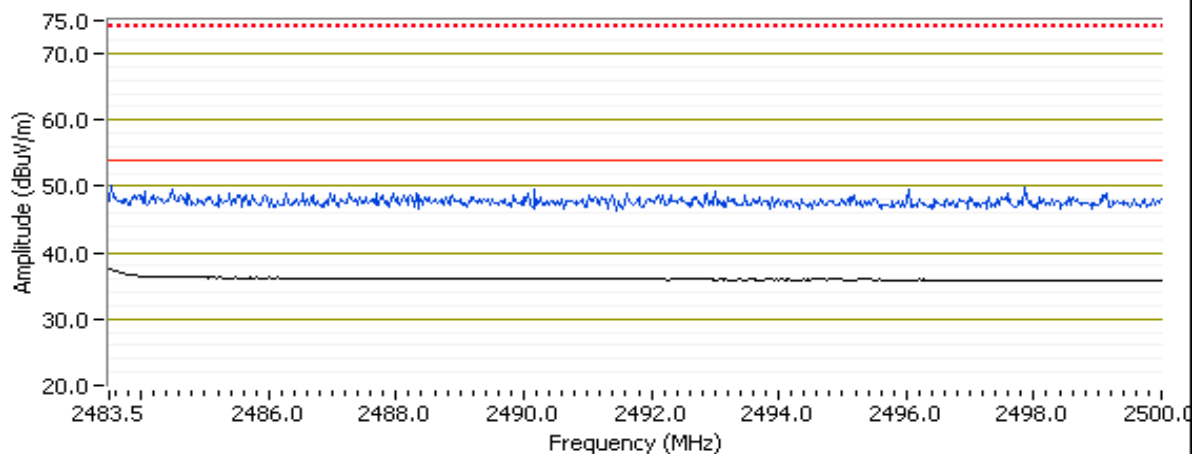
| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 42.8         | V   | 54.0            | -11.2  | AVG       | 160     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2483.550  | 50.6         | V   | 74.0            | -23.4  | PK        | 160     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 38.7         | H   | 54.0            | -15.3  | AVG       | 235     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2490.130  | 49.1         | H   | 74.0            | -24.9  | PK        | 235     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

RB 1 MHz; VB 10 Hz = avg (Black) 1MHz=RB=VB=Pk (blue) vertical



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (Black) 1MHz=RB=VB=Pk (blue) horizontal





|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2, Band Edge Field Strength - EDR (3 Mb/s), Chain A

Date of Test: 10/5/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#3

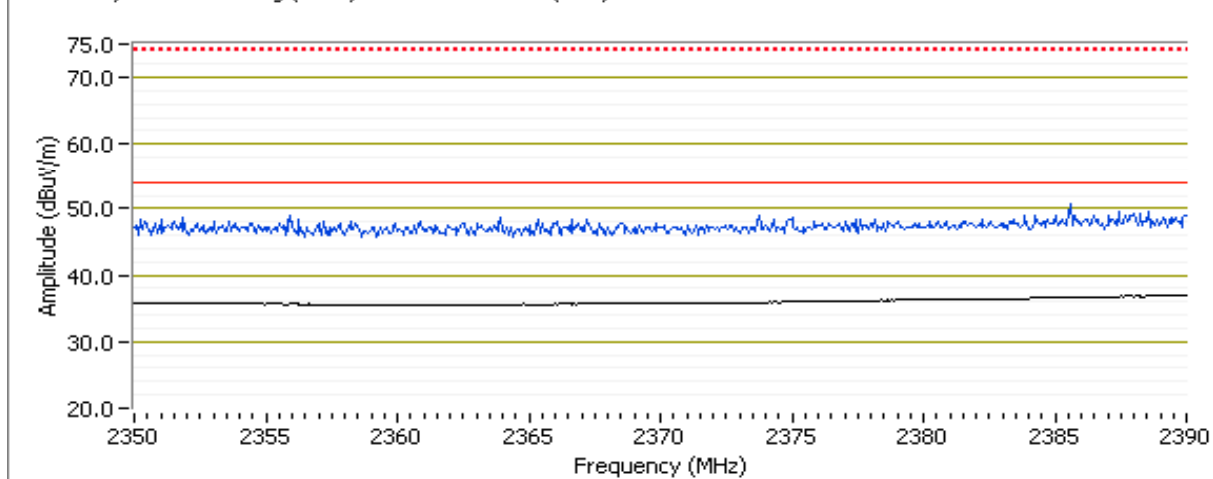
Config Change: none

Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

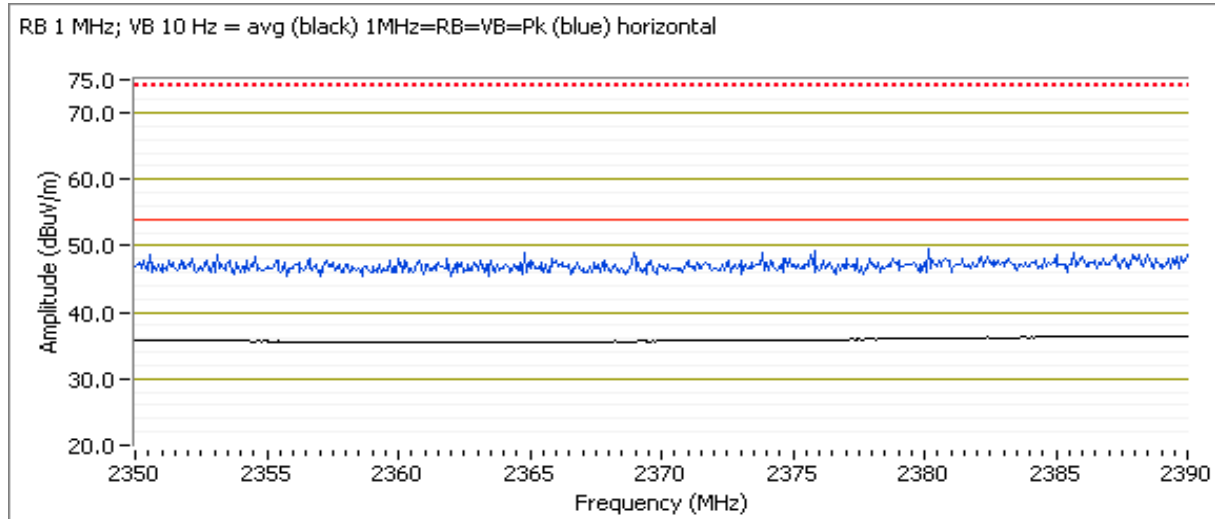
## 2390 MHz Band Edge Signal Field Strength

| Frequency | Level        | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2387.930  | 38.7         | V   | 54.0            | -15.3  | AVG       | 173     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2385.400  | 49.6         | V   | 74.0            | -24.4  | PK        | 173     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2389.870  | 38.4         | H   | 54.0            | -15.6  | AVG       | 173     | 1.2    | RB 1 MHz;VB 10 Hz;Pk |
| 2366.470  | 49.4         | H   | 74.0            | -24.6  | PK        | 173     | 1.2    | RB 1 MHz;VB 3 MHz;Pk |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



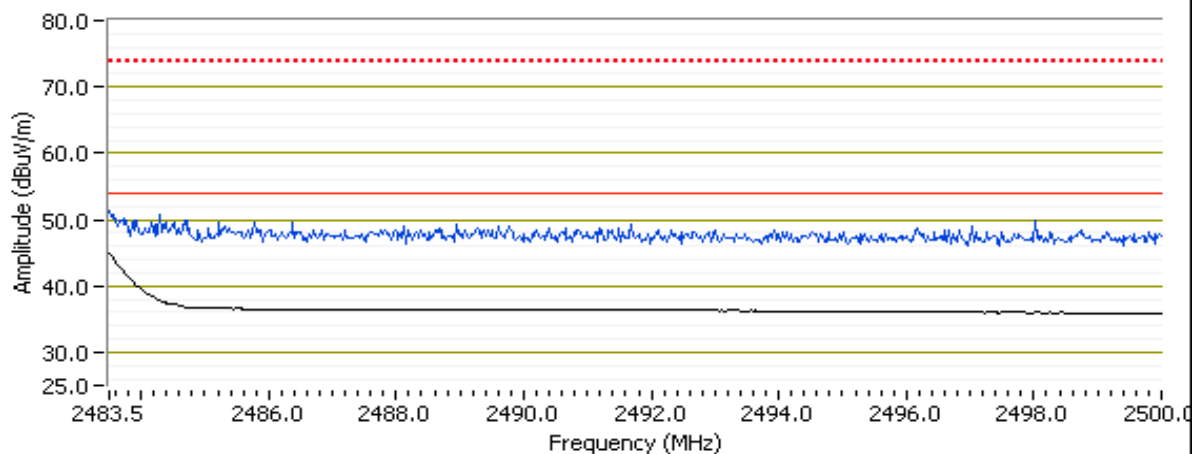
Run # 2b, EUT on Channel 2480MHz - EDR (3 Mb/s), Chain A

## 2483.5 MHz Band Edge Signal Radiated Field Strength

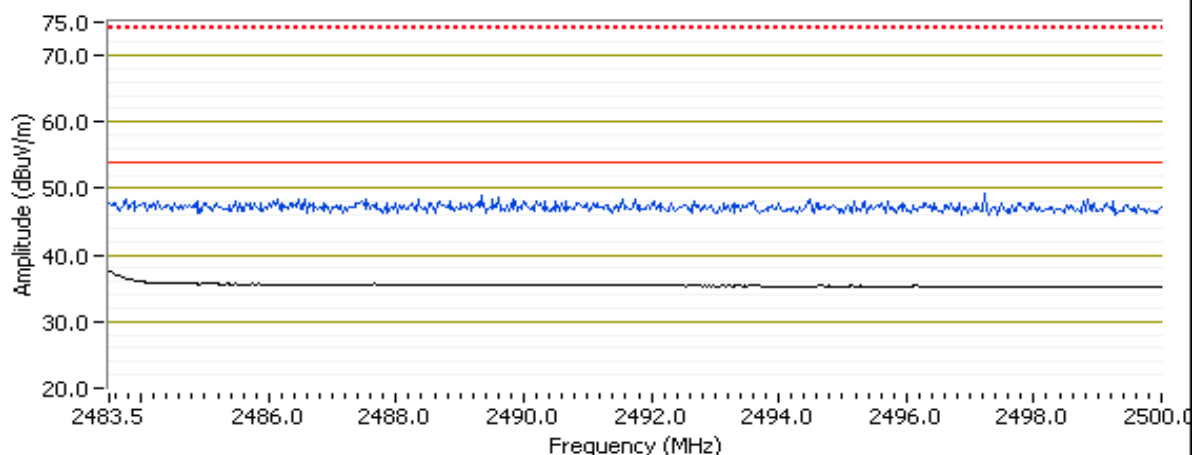
| Frequency | Level  | Pol | 15.209 / 15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------|-----|-----------------|--------|-----------|---------|--------|----------------------|
| MHz       | dBuV/m | v/h | Limit           | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2483.500  | 43.7   | V   | 54.0            | -10.3  | AVG       | 161     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2483.550  | 50.3   | V   | 74.0            | -23.7  | PK        | 161     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2483.500  | 38.5   | H   | 54.0            | -15.5  | AVG       | 242     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2493.340  | 49.3   | H   | 74.0            | -24.7  | PK        | 242     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) vertical



RB 1 MHz; VB 10 Hz = avg (black) 1MHz=RB=VB=Pk (blue) horizontal



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

For Bluetooth: Tx is chain B, Rx is chain B

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100m period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                   | Channel | Antenna       | Power Setting | Test Performed                  | Limit               | Result / Margin                     |
|---------|------------------------|---------|---------------|---------------|---------------------------------|---------------------|-------------------------------------|
| Run #1  | Basic (1 Mb/s) Chain A | 2402MHz | Ethertronic s | max           | Radiated Emissions, 1 - 26 GHz  | FCC 15.209 / 15.247 | 46.4 dBμV/m @ 2994.5 MHz (-7.6 dB)  |
|         |                        | 2440MHz | Ethertronic s | max           |                                 |                     | 46.1 dBμV/m @ 2994.5 MHz (-7.9 dB)  |
|         |                        | 2480MHz | Ethertronic s | max           |                                 |                     | 41.3 dBμV/m @ 2994.7 MHz (-12.7 dB) |
| Run # 2 | EDR (3 Mb/s) Chain A   | 2402MHz | Ethertronic s | max           | Radiated Emissions, 1 - 26 GHz  | FCC 15.209 / 15.247 | 45.0 dBμV/m @ 2994.7 MHz (-9.0 dB)  |
|         |                        | 2440MHz | Ethertronic s | max           |                                 |                     | 44.7 dBμV/m @ 2994.7 MHz (-9.3 dB)  |
|         |                        | 2480MHz | Ethertronic s | max           |                                 |                     | 38.5 dBμV/m @ 1653.3 MHz (-15.5 dB) |
| 3       | Bluetooth Receive      | 2440    | Ethertronic s | -             | Radiated Emissions, 1 - 7.5 GHz | RSS 210             | 43.2dBμV/m @ 2994.7MHz (-10.8dB)    |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

**Ambient Conditions:**

|                |          |
|----------------|----------|
| Temperature:   | 20-25 °C |
| Rel. Humidity: | 40-50 %  |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run #1, Radiated Spurious Emissions, 1-26GHz, Basic (1 Mb/s), Chain A

Date of Test: 10/19/2011

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: None

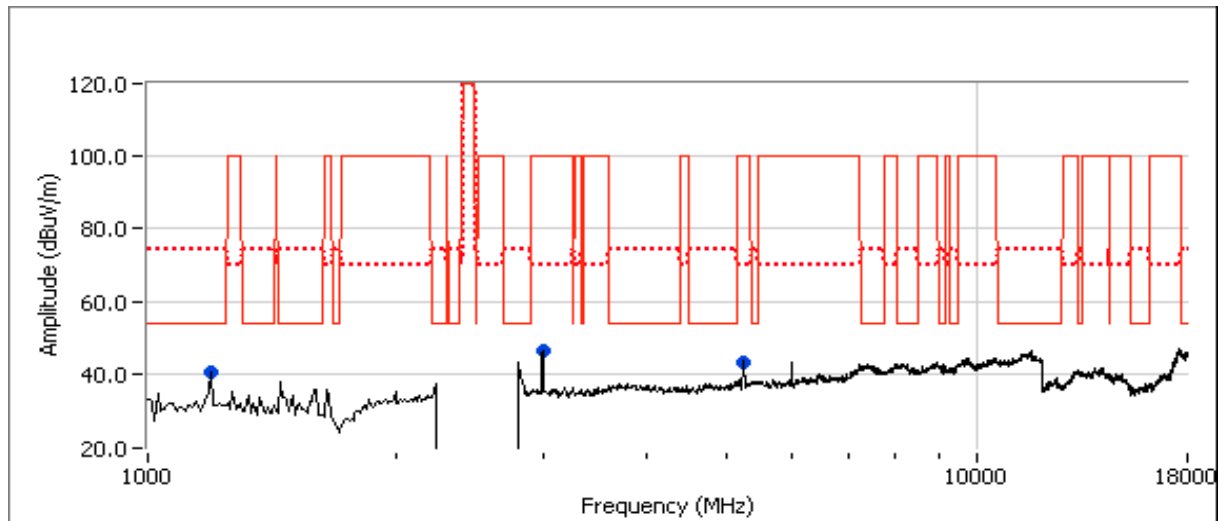
## Run #1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

### Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | PK/QP/Avg | degrees | meters |                      |
| 2994.490  | 46.4         | V   | 54.0          | -7.6   | Peak      | 106     | 1.0    | Note 2               |
| 5236.270  | 43.5         | V   | 54.0          | -10.5  | Peak      | 218     | 1.0    | Note 2               |
| 1195.690  | 36.1         | V   | 54.0          | -17.9  | AVG       | 164     | 1.2    | RB 1 MHz;VB 10 Hz;Pk |
| 1196.360  | 49.6         | V   | 74.0          | -24.4  | PK        | 164     | 1.2    | RB 1 MHz;VB 3 MHz;Pk |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209. Peak reading vs the average limit.



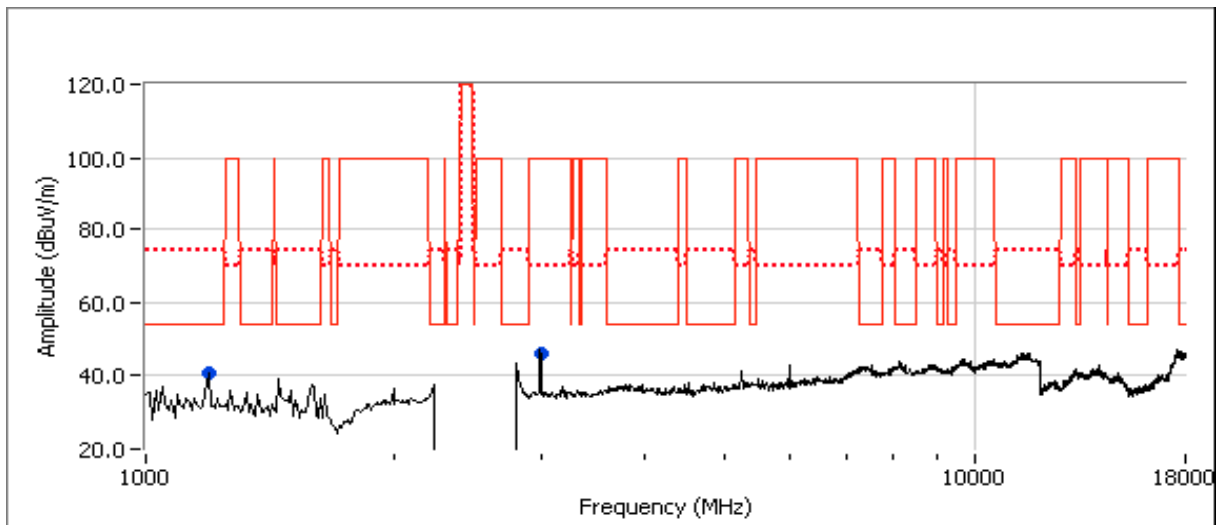
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run #1b: , EUT on Channel 2440MHz - Basic (1 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2994.490  | 46.1         | V   | 54.0          | -7.9   | Peak      | 103     | 1.0    | Note 3               |
| 1197.010  | 37.0         | V   | 54.0          | -17.0  | AVG       | 224     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1195.840  | 50.1         | V   | 74.0          | -23.9  | PK        | 224     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209. Peak reading vs the average limit.                                                                                       |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

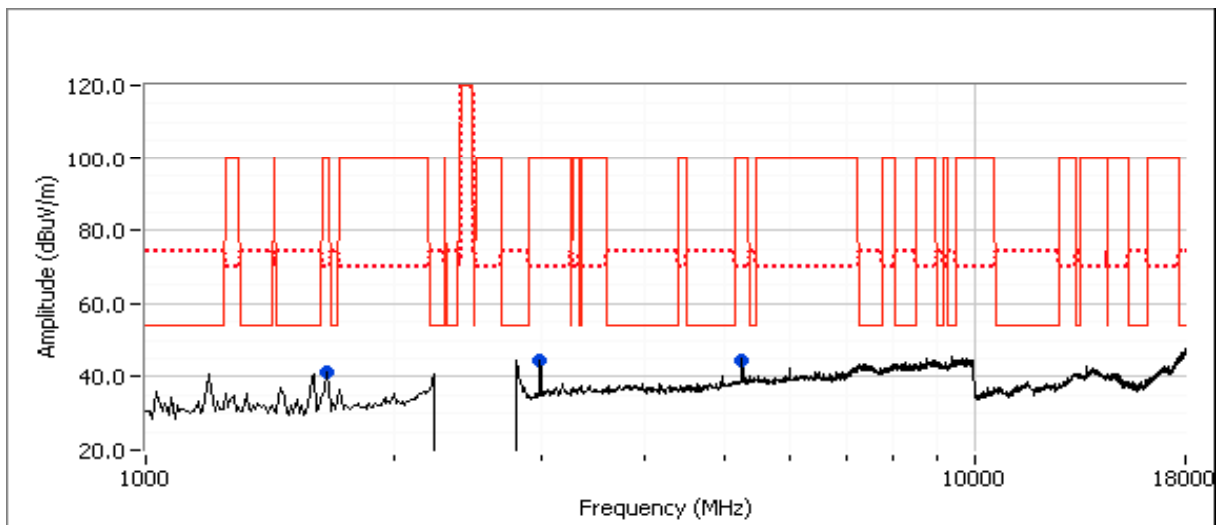
Run #1c: , EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 41.3         | V   | 54.0          | -12.7  | AVG       | 114     | 1.3    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1653.440  | 41.1         | H   | 54.0          | -12.9  | AVG       | 28      | 1.3    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5242.270  | 33.5         | V   | 54.0          | -20.5  | AVG       | 244     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 2994.760  | 46.6         | V   | 74.0          | -27.4  | PK        | 114     | 1.3    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 5244.000  | 44.6         | V   | 74.0          | -29.4  | PK        | 244     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1653.340  | 43.9         | H   | 74.0          | -30.1  | PK        | 28      | 1.3    | RB 1 MHz;VB 3 MHz;Pk, note 2 |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.





|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run # 2, Radiated Spurious Emissions, 1-26GHz, EDR (3 Mb/s), Chain A

Date of Test: 10/26/2011

Test Location: FT Chamber #5

Test Engineer: Joseph Cadigal

Config Change: none

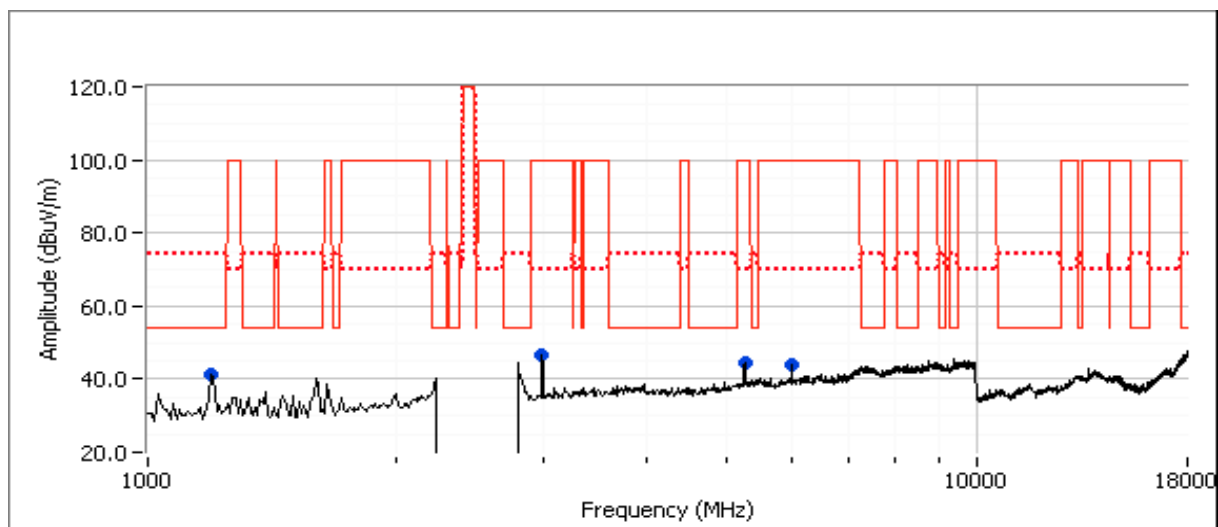
## Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

### Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 45.0         | V   | 54.0          | -9.0   | AVG       | 139     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5990.110  | 34.0         | V   | 54.0          | -20.0  | AVG       | 134     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5244.230  | 34.0         | V   | 54.0          | -20.0  | AVG       | 202     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1188.820  | 31.2         | V   | 54.0          | -22.8  | AVG       | 212     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 2994.690  | 49.2         | V   | 74.0          | -24.8  | PK        | 139     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 5244.100  | 47.5         | V   | 74.0          | -26.5  | PK        | 202     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 5991.600  | 47.2         | V   | 74.0          | -26.8  | PK        | 134     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1189.760  | 38.9         | V   | 74.0          | -35.1  | PK        | 212     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



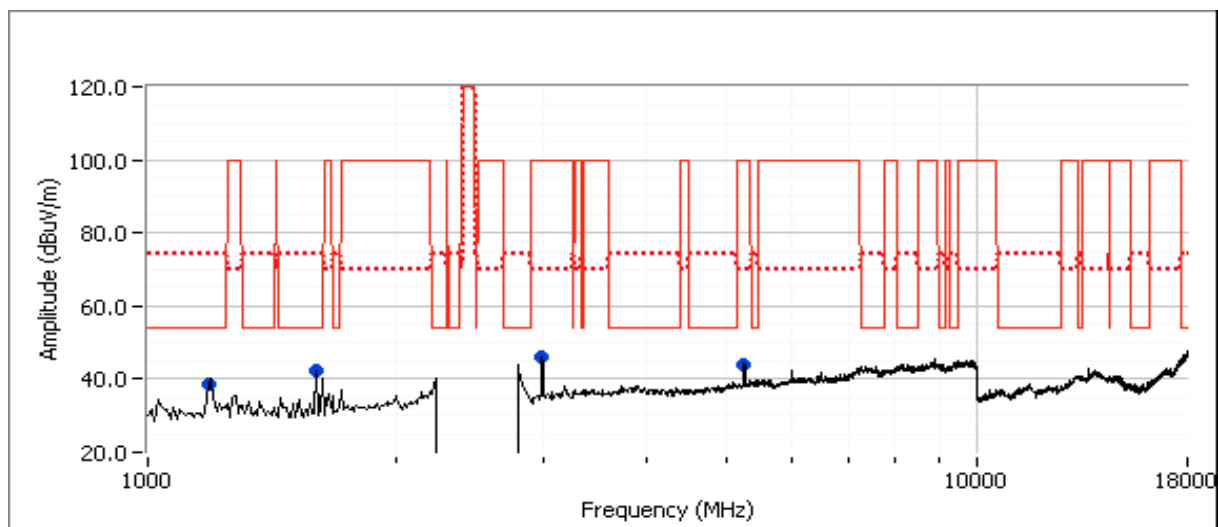
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2b: , EUT on Channel 2440MHz - EDR (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.700  | 44.7         | V   | 54.0          | -9.3   | AVG       | 138     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 5235.430  | 34.7         | V   | 54.0          | -19.3  | AVG       | 198     | 1.3    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 2994.540  | 49.9         | V   | 74.0          | -24.1  | PK        | 138     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1186.510  | 29.3         | V   | 54.0          | -24.7  | AVG       | 213     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 5235.960  | 49.3         | V   | 74.0          | -24.7  | PK        | 198     | 1.3    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1604.380  | 27.7         | V   | 54.0          | -26.3  | AVG       | 189     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 1185.950  | 40.6         | V   | 74.0          | -33.4  | PK        | 213     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |
| 1603.690  | 39.0         | V   | 74.0          | -35.0  | PK        | 189     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209.                                                                                                                          |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

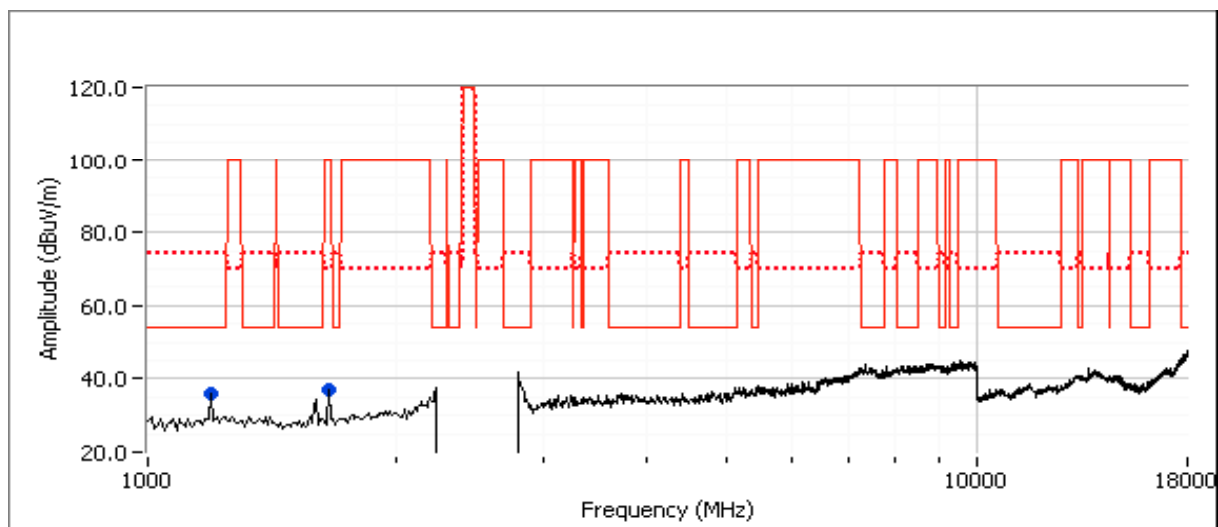
Run # 2c : EUT on Channel 2480MHz - Basic (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 1653.320  | 38.5         | V   | 54.0          | -15.5  | AVG       | 314     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1184.310  | 27.3         | V   | 54.0          | -26.7  | AVG       | 314     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 1653.310  | 43.8         | V   | 74.0          | -30.2  | PK        | 314     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1184.240  | 37.7         | V   | 74.0          | -36.3  | PK        | 314     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 3, Radiated Spurious Emissions, 1-7.5GHz, Receive, Chain A

Date of Test: 10/26/2011

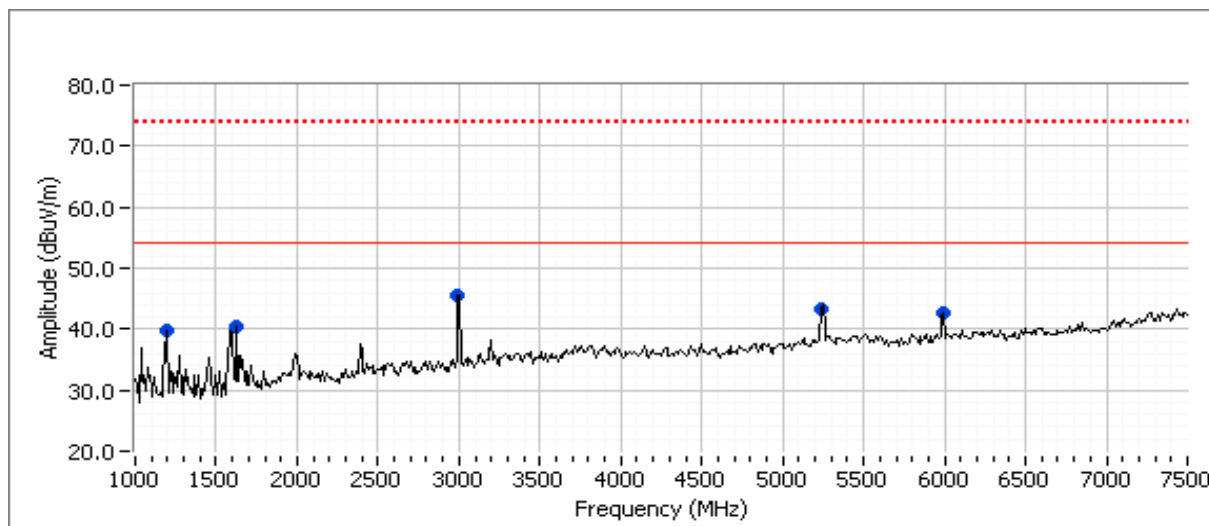
Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal

Config Change: none

Run # 3a, EUT on Channel #6 2437MHz - Receive, Chain A

| Frequency | Level        | Pol | RSS 210 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|---------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit   | Margin | PK/QP/Avg | degrees | meters |                      |
| 2994.660  | 43.2         | V   | 54.0    | -10.8  | AVG       | 138     | 1.3    | RB 1 MHz;VB 10 Hz;Pk |
| 1628.660  | 36.7         | V   | 54.0    | -17.3  | AVG       | 300     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1188.750  | 35.1         | V   | 54.0    | -18.9  | AVG       | 192     | 1.6    | RB 1 MHz;VB 10 Hz;Pk |
| 5237.840  | 33.3         | V   | 54.0    | -20.7  | AVG       | 228     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 5996.390  | 33.0         | V   | 54.0    | -21.0  | AVG       | 144     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 2994.710  | 47.5         | V   | 74.0    | -26.5  | PK        | 138     | 1.3    | RB 1 MHz;VB 3 MHz;Pk |
| 5238.460  | 45.9         | V   | 74.0    | -28.1  | PK        | 228     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 5994.660  | 44.7         | V   | 74.0    | -29.3  | PK        | 144     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1628.730  | 41.3         | V   | 74.0    | -32.7  | PK        | 300     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1187.180  | 36.9         | V   | 74.0    | -37.1  | PK        | 192     | 1.6    | RB 1 MHz;VB 3 MHz;Pk |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

For Bluetooth: Tx is chain B, Rx is chain B

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100m period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                   | Channel | Antenna | Power Setting | Test Performed                  | Limit               | Result / Margin                     |
|---------|------------------------|---------|---------|---------------|---------------------------------|---------------------|-------------------------------------|
| Run #1  | Basic (1 Mb/s) Chain A | 2402MHz | H&S     | max           | Radiated Emissions, 1 - 26 GHz  | FCC 15.209 / 15.247 | 36.7 dBµV/m @ 5238.4 MHz (-17.3 dB) |
|         |                        | 2440MHz | H&S     | max           |                                 |                     | 45.6 dBµV/m @ 2994.7 MHz (-8.4 dB)  |
|         |                        | 2480MHz | H&S     | max           |                                 |                     | 46.5 dBµV/m @ 2994.7 MHz (-7.5 dB)  |
| Run # 2 | EDR (3 Mb/s) Chain A   | 2402MHz | H&S     | max           | Radiated Emissions, 1 - 26 GHz  | FCC 15.209 / 15.247 | 36.8 dBµV/m @ 5235.6 MHz (-17.2 dB) |
|         |                        | 2440MHz | H&S     | max           |                                 |                     | 44.3 dBµV/m @ 2994.7 MHz (-9.7 dB)  |
|         |                        | 2480MHz | H&S     | max           |                                 |                     | 44.5 dBµV/m @ 2994.7 MHz (-9.5 dB)  |
| 3       | Bluetooth Receive      | 2440    | H&S     | -             | Radiated Emissions, 1 - 7.5 GHz | RSS 210             | 42.7dBµV/m @ 5989.3MHz (-11.3dB)    |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

**Ambient Conditions:**

|                |          |
|----------------|----------|
| Temperature:   | 20-25 °C |
| Rel. Humidity: | 40-50 %  |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run #1, Radiated Spurious Emissions, 1-26GHz, Basic (1 Mb/s), Chain A

Date of Test: 10/12/2011

Test Location: FT Chamber#4

Test Engineer: Joseph Cadigal

Config Change:

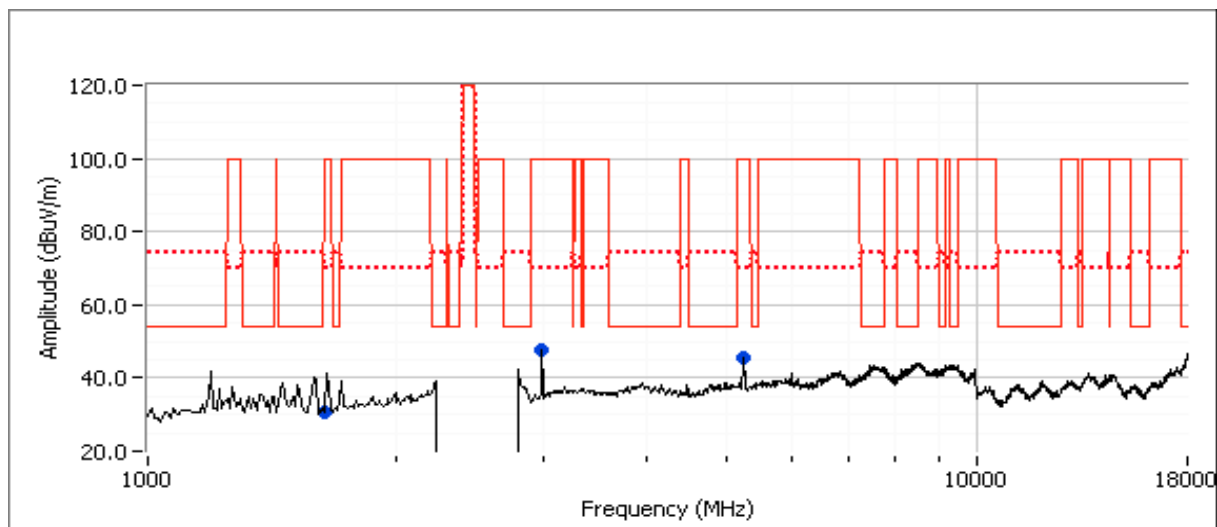
## Run #1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

### Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 5238.430  | 36.7         | V   | 54.0          | -17.3  | AVG       | 202     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 2994.690  | 32.5         | V   | 54.0          | -21.5  | AVG       | 150     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5236.210  | 51.5         | V   | 74.0          | -22.5  | PK        | 202     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1636.500  | 26.4         | H   | 54.0          | -27.6  | AVG       | 256     | 2.2    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 2994.710  | 42.6         | V   | 74.0          | -31.4  | PK        | 150     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1635.100  | 37.2         | H   | 74.0          | -36.8  | PK        | 256     | 2.2    | RB 1 MHz;VB 3 MHz;Pk, note 2 |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



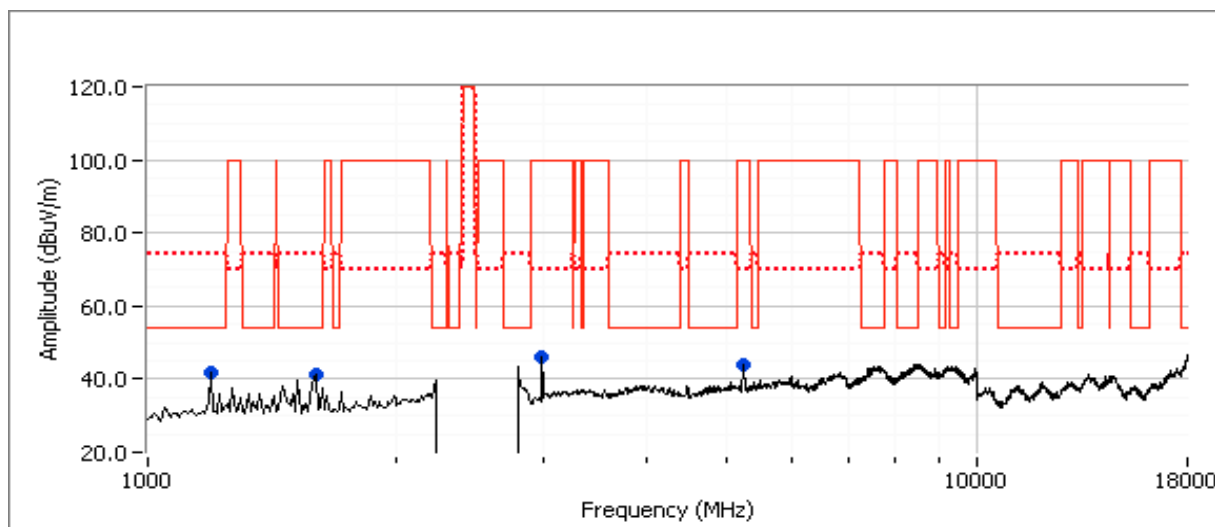
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run #1b: , EUT on Channel 2440MHz - Basic (1 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 45.6         | V   | 54.0          | -8.4   | AVG       | 194     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 5252.290  | 33.2         | V   | 54.0          | -20.8  | AVG       | 210     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 1195.900  | 31.0         | V   | 54.0          | -23.0  | AVG       | 173     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 2994.680  | 50.6         | V   | 74.0          | -23.4  | PK        | 194     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1592.770  | 28.4         | V   | 54.0          | -25.6  | AVG       | 0       | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 1195.410  | 46.5         | V   | 74.0          | -27.5  | PK        | 173     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |
| 5252.090  | 44.2         | V   | 74.0          | -29.8  | PK        | 210     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1593.600  | 39.7         | V   | 74.0          | -34.3  | PK        | 0       | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209.                                                                                                                          |





|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

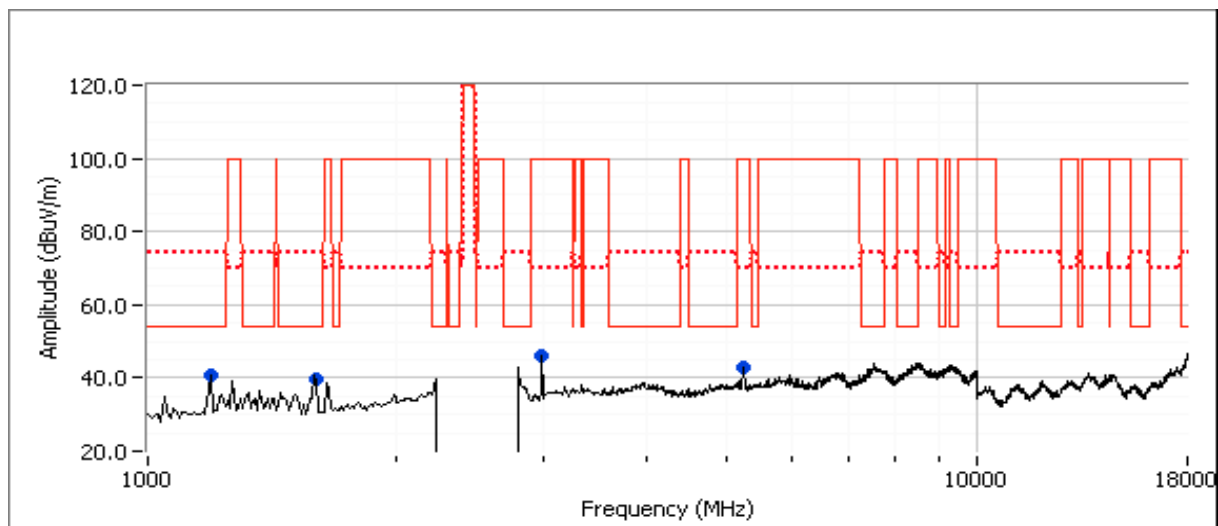
Run #1c: , EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.670  | 46.5         | V   | 54.0          | -7.5   | AVG       | 187     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5240.130  | 36.8         | V   | 54.0          | -17.2  | AVG       | 187     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1198.120  | 34.8         | V   | 54.0          | -19.2  | AVG       | 187     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 5240.270  | 51.5         | V   | 74.0          | -22.5  | PK        | 187     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 2994.720  | 50.8         | V   | 74.0          | -23.2  | PK        | 187     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1198.300  | 49.6         | V   | 74.0          | -24.4  | PK        | 187     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |
| 1595.760  | 29.4         | V   | 54.0          | -24.6  | AVG       | 360     | 1.6    | RB 1 MHz;VB 10 Hz;Pk         |
| 1596.540  | 49.1         | V   | 74.0          | -24.9  | PK        | 360     | 1.6    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2, Radiated Spurious Emissions, 1-26GHz, EDR (3 Mb/s), Chain A

Date of Test: 10/12/2011

Test Location: FT Chamber#4

Test Engineer: Joseph Cadigal

Config Change: none

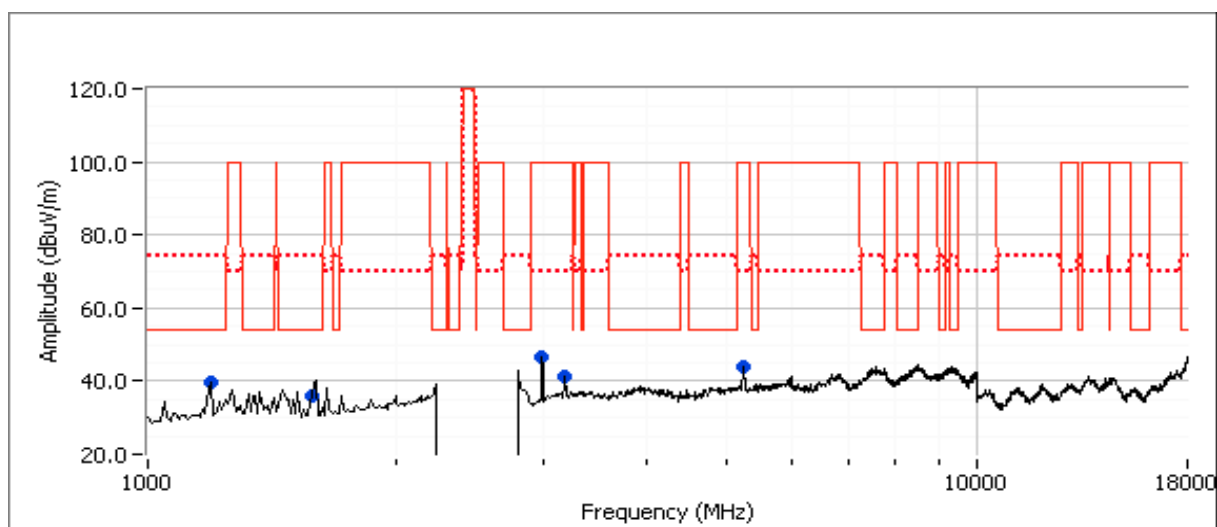
Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level  | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dBμV/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 5235.570  | 36.8   | V   | 54.0          | -17.2  | AVG       | 184     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 3189.370  | 33.3   | V   | 54.0          | -20.7  | AVG       | 184     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5235.170  | 53.0   | V   | 74.0          | -21.0  | PK        | 184     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 2990.580  | 29.6   | V   | 54.0          | -24.4  | AVG       | 154     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 3191.260  | 47.7   | V   | 74.0          | -26.3  | PK        | 184     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1193.890  | 27.5   | V   | 54.0          | -26.5  | AVG       | 174     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 2989.810  | 42.0   | V   | 74.0          | -32.0  | PK        | 154     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1193.810  | 41.2   | V   | 74.0          | -32.8  | PK        | 174     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



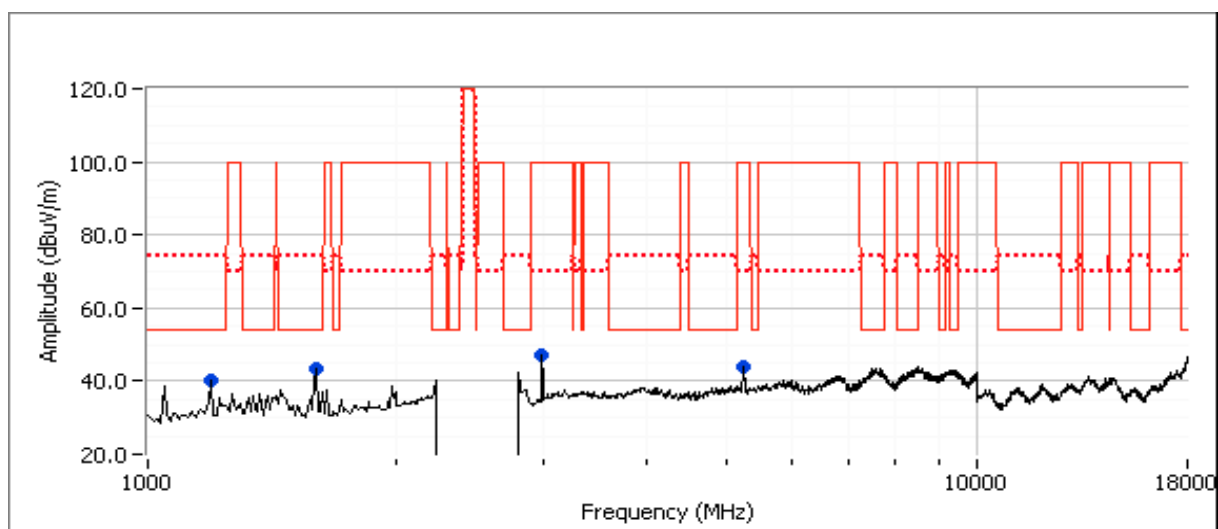
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2b: , EUT on Channel 2440MHz - EDR (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 44.3         | V   | 54.0          | -9.7   | AVG       | 196     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 5246.100  | 36.3         | V   | 54.0          | -17.7  | AVG       | 188     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 1198.130  | 34.0         | V   | 54.0          | -20.0  | AVG       | 196     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 5246.540  | 51.1         | V   | 74.0          | -22.9  | PK        | 188     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1197.460  | 49.1         | V   | 74.0          | -24.9  | PK        | 196     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |
| 1593.840  | 49.0         | V   | 74.0          | -25.0  | PK        | 358     | 1.9    | RB 1 MHz;VB 3 MHz;Pk         |
| 2994.720  | 48.1         | V   | 74.0          | -25.9  | PK        | 196     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1593.310  | 28.0         | V   | 54.0          | -26.0  | AVG       | 358     | 1.9    | RB 1 MHz;VB 10 Hz;Pk         |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209.                                                                                                                          |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

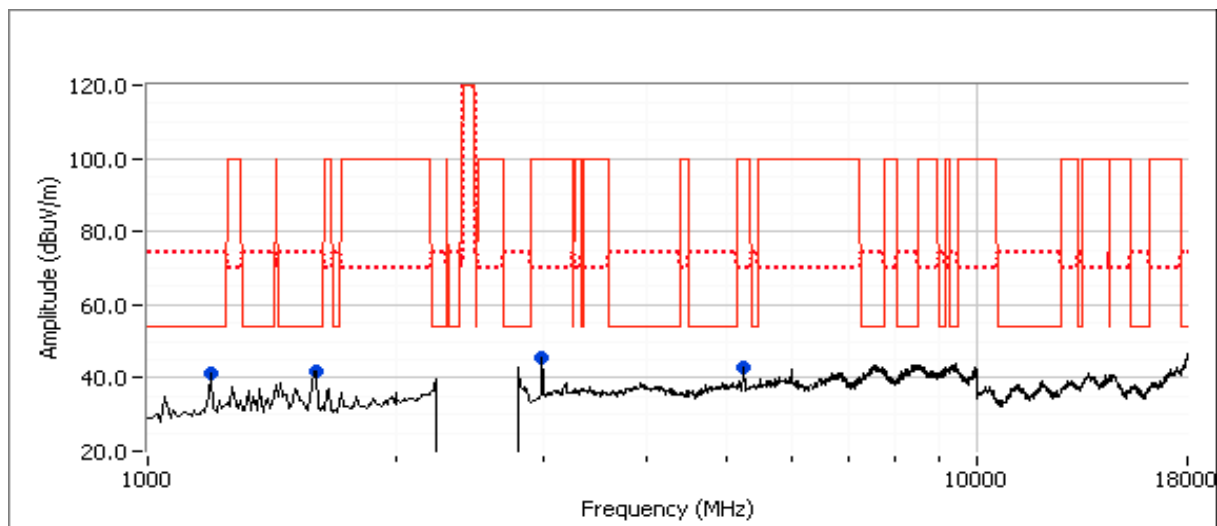
Run # 2c: , EUT on Channel 2480MHz - Basic (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.670  | 44.5         | V   | 54.0          | -9.5   | AVG       | 188     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5249.500  | 33.2         | V   | 54.0          | -20.8  | AVG       | 199     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1597.740  | 51.1         | V   | 74.0          | -22.9  | PK        | 360     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |
| 1597.770  | 30.0         | V   | 54.0          | -24.0  | AVG       | 360     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 2994.440  | 49.9         | V   | 74.0          | -24.1  | PK        | 188     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1184.370  | 26.0         | V   | 54.0          | -28.0  | AVG       | 212     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 5249.970  | 44.9         | V   | 74.0          | -29.1  | PK        | 199     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1185.250  | 36.4         | V   | 74.0          | -37.6  | PK        | 212     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 3, Radiated Spurious Emissions, 1-7.5GHz, Receive, Chain A

Date of Test: 10/12/2011

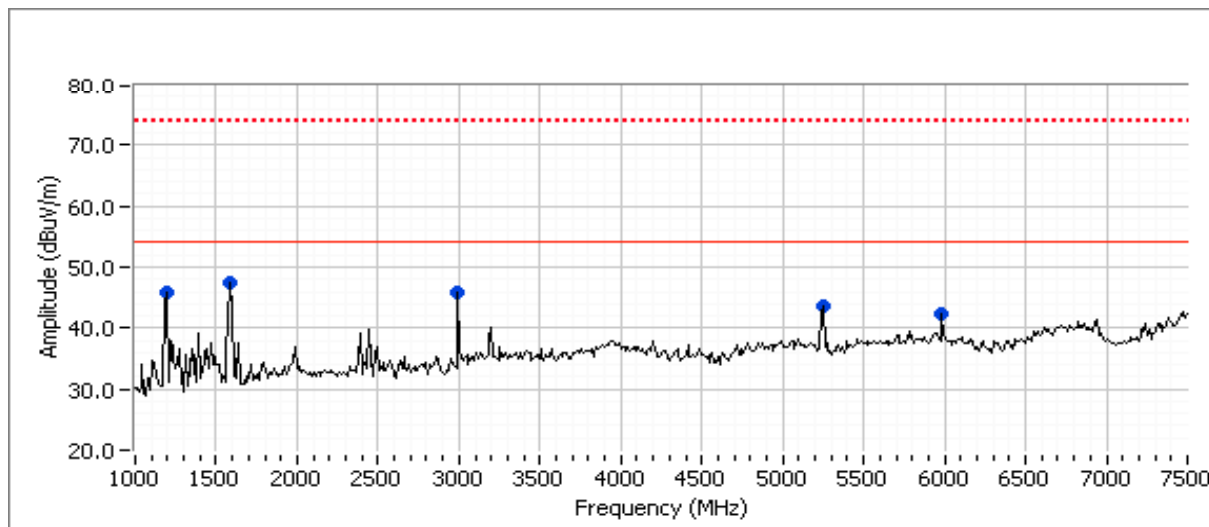
Test Location: FT Chamber#4

Test Engineer: Joseph Cadigal

Config Change: none

Run # 3a, EUT on Channel #6 2437MHz - Receive, Chain A

| Frequency | Level        | Pol | RSS 210 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|---------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit   | Margin | PK/QP/Avg | degrees | meters |                      |
| 5989.330  | 42.7         | V   | 54.0    | -11.3  | AVG       | 161     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 5244.060  | 36.6         | V   | 54.0    | -17.4  | AVG       | 183     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1596.930  | 56.3         | V   | 74.0    | -17.7  | PK        | 198     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2994.640  | 34.7         | V   | 54.0    | -19.3  | AVG       | 165     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1597.210  | 33.1         | V   | 54.0    | -20.9  | AVG       | 198     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 5246.930  | 52.2         | V   | 74.0    | -21.8  | PK        | 183     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1190.360  | 29.1         | V   | 54.0    | -24.9  | AVG       | 194     | 1.3    | RB 1 MHz;VB 10 Hz;Pk |
| 5989.160  | 48.8         | V   | 74.0    | -25.2  | PK        | 161     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2994.730  | 42.0         | V   | 74.0    | -32.0  | PK        | 165     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1189.330  | 39.0         | V   | 74.0    | -35.0  | PK        | 194     | 1.3    | RB 1 MHz;VB 3 MHz;Pk |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Bluetooth)

### Summary of Results - Device Operating in the 2400-2483.5 MHz Band

For Bluetooth: Tx is chain B, Rx is chain B

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100m period is  $4 \times 3.125\text{ms} = 12.5\text{ms}$ .

The average correction factor is, therefore,  $20\log(12.5/100) = -18\text{dB}$

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the measured average value for frequency hopping radios.

| Run #   | Mode                      | Channel | Antenna | Power Setting | Test Performed                     | Limit               | Result / Margin                     |
|---------|---------------------------|---------|---------|---------------|------------------------------------|---------------------|-------------------------------------|
| Run #1  | Basic (1 Mb/s)<br>Chain A | 2402MHz | Cisco   | max           | Radiated Emissions,<br>1 - 26 GHz  | FCC 15.209 / 15.247 | 44.8 dBµV/m @ 2994.7 MHz (-9.2 dB)  |
|         |                           | 2440MHz | Cisco   | max           |                                    |                     | 46.0 dBµV/m @ 2994.7 MHz (-8.0 dB)  |
|         |                           | 2480MHz | Cisco   | max           |                                    |                     | 39.9 dBµV/m @ 2994.6 MHz (-14.1 dB) |
| Run # 2 | EDR (3 Mb/s)<br>Chain A   | 2402MHz | Cisco   | max           | Radiated Emissions,<br>1 - 26 GHz  | FCC 15.209 / 15.247 | 46.1 dBµV/m @ 2994.7 MHz (-7.9 dB)  |
|         |                           | 2440MHz | Cisco   | max           |                                    |                     | 45.9 dBµV/m @ 2994.7 MHz (-8.1 dB)  |
|         |                           | 2480MHz | Cisco   | max           |                                    |                     | 46.1 dBµV/m @ 2994.7 MHz (-7.9 dB)  |
| 3       | Bluetooth Receive         | 2440    | Cisco   | -             | Radiated Emissions,<br>1 - 7.5 GHz | RSS 210             | 45.0dBµV/m @ 2994.7MHz (-9.0dB)     |

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

**Ambient Conditions:**

Temperature: 20-25 °C  
Rel. Humidity: 40-50 %

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## Run #1, Radiated Spurious Emissions, 1-26GHz, Basic (1 Mb/s), Chain A

Date of Test: 10/6/2011

Test Location: FT Chamber #4

Test Engineer: Joseph Cadigal

Config Change: none

## Run #1a, EUT on Channel 2402MHz - Basic (1 Mb/s), Chain A

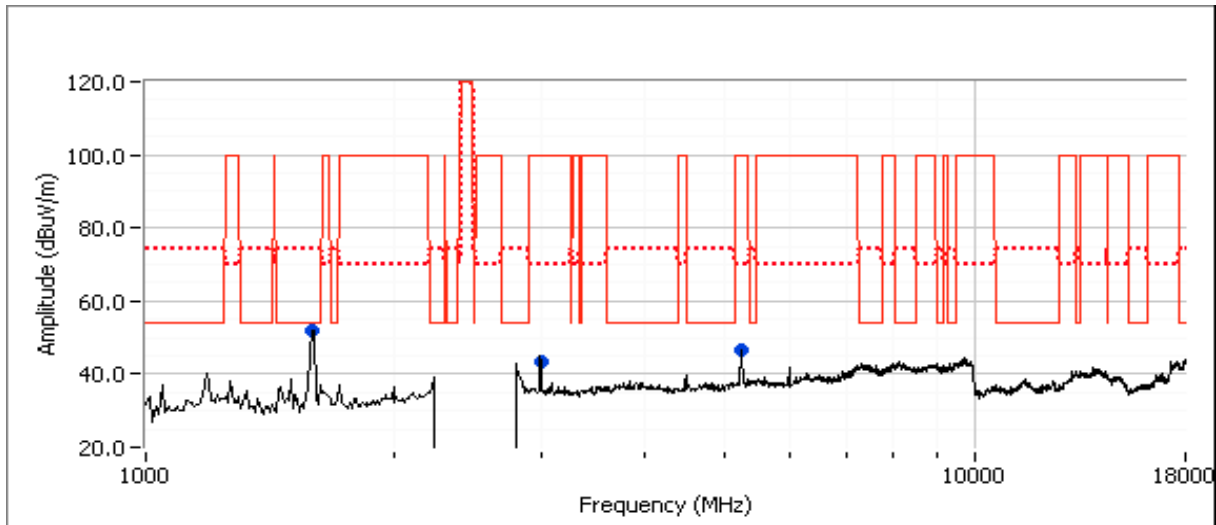
### Spurious Radiated Emissions:

| Frequency | Level  | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dBµV/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 44.8   | V   | 54.0          | -9.2   | AVG       | 152     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1594.030  | 57.9   | V   | 74.0          | -16.1  | PK        | 159     | 1.6    | RB 1 MHz;VB 3 MHz;Pk         |
| 1594.490  | 34.3   | V   | 54.0          | -19.7  | AVG       | 159     | 1.6    | RB 1 MHz;VB 10 Hz;Pk         |
| 5221.550  | 33.2   | V   | 54.0          | -20.8  | AVG       | 214     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 2994.610  | 49.3   | V   | 74.0          | -24.7  | PK        | 152     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 5221.930  | 44.8   | V   | 74.0          | -29.2  | PK        | 214     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



Run #1b: , EUT on Channel 2440MHz - Basic (1 Mb/s), Chain A

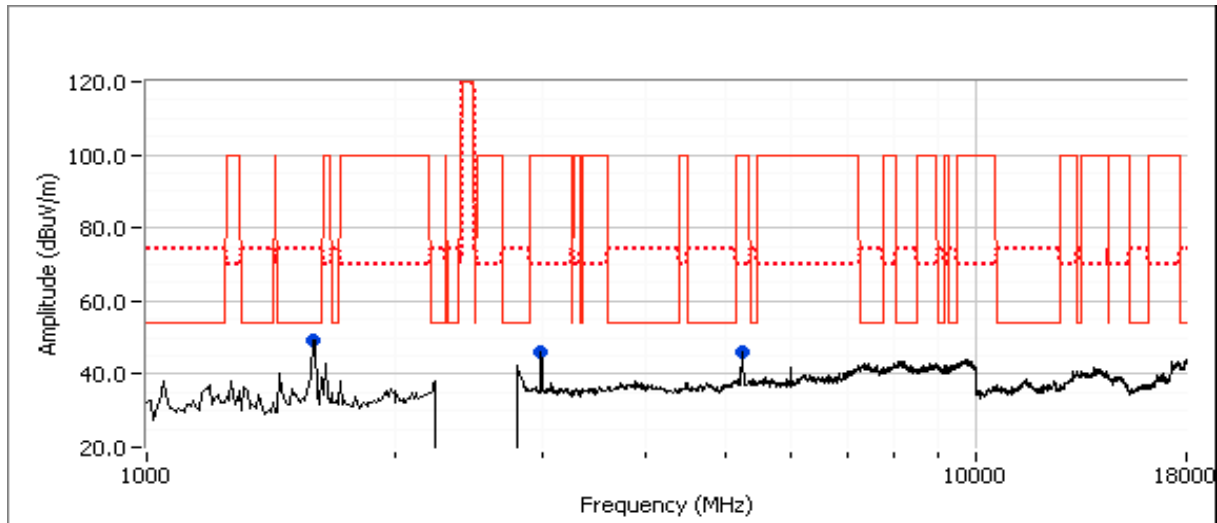
## Spurious Radiated Emissions:

| Frequency | Level  | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dBuV/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.710  | 46.0   | V   | 54.0          | -8.0   | AVG       | 184     | 1.3    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 5235.790  | 38.9   | V   | 54.0          | -15.1  | AVG       | 158     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 1596.970  | 58.9   | V   | 74.0          | -15.1  | PK        | 210     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |
| 5236.230  | 54.2   | V   | 74.0          | -19.8  | PK        | 158     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1595.870  | 33.9   | V   | 54.0          | -20.1  | AVG       | 210     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 2994.400  | 50.5   | V   | 74.0          | -23.5  | PK        | 184     | 1.3    | RB 1 MHz;VB 3 MHz;Pk, note 3 |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209.                                                                                                                          |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



Run #1c: , EUT on Channel 2480MHz - Basic (1 Mb/s), Chain A

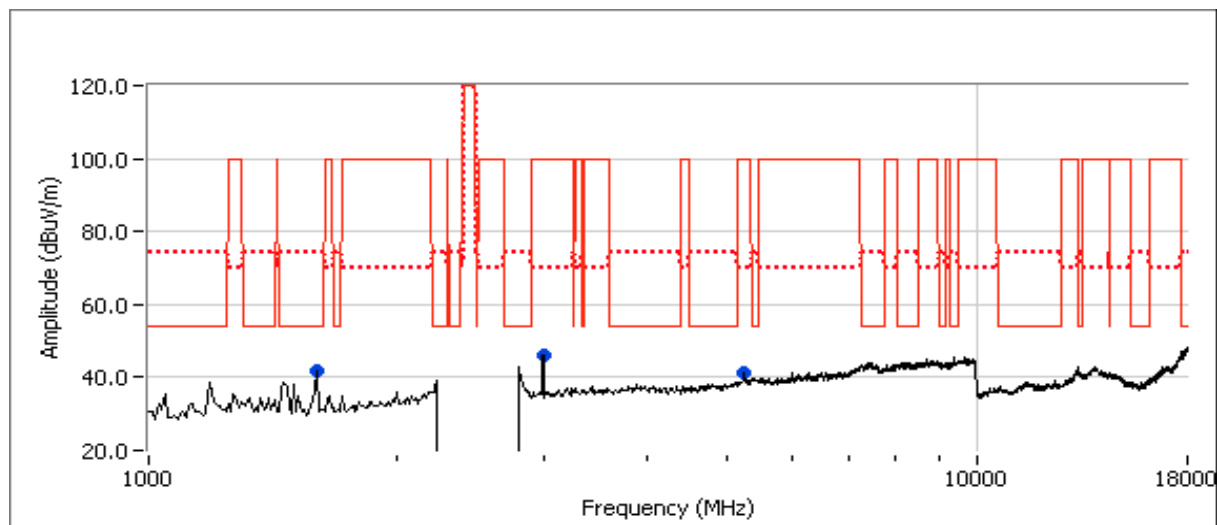
## Spurious Radiated Emissions:

| Frequency | Level  | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dBuV/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.640  | 39.9   | V   | 54.0          | -14.1  | AVG       | 98      | 1.3    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5242.540  | 34.2   | V   | 54.0          | -19.8  | AVG       | 162     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1595.770  | 27.7   | V   | 54.0          | -26.3  | AVG       | 172     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 5241.400  | 47.5   | V   | 74.0          | -26.5  | PK        | 162     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1596.110  | 46.5   | V   | 74.0          | -27.5  | PK        | 172     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |
| 2994.590  | 45.8   | V   | 74.0          | -28.2  | PK        | 98      | 1.3    | RB 1 MHz;VB 3 MHz;Pk, note 2 |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2, Radiated Spurious Emissions, 1-26GHz, EDR (3 Mb/s), Chain A

Date of Test: 10/12/2011

Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal

Config Change: none

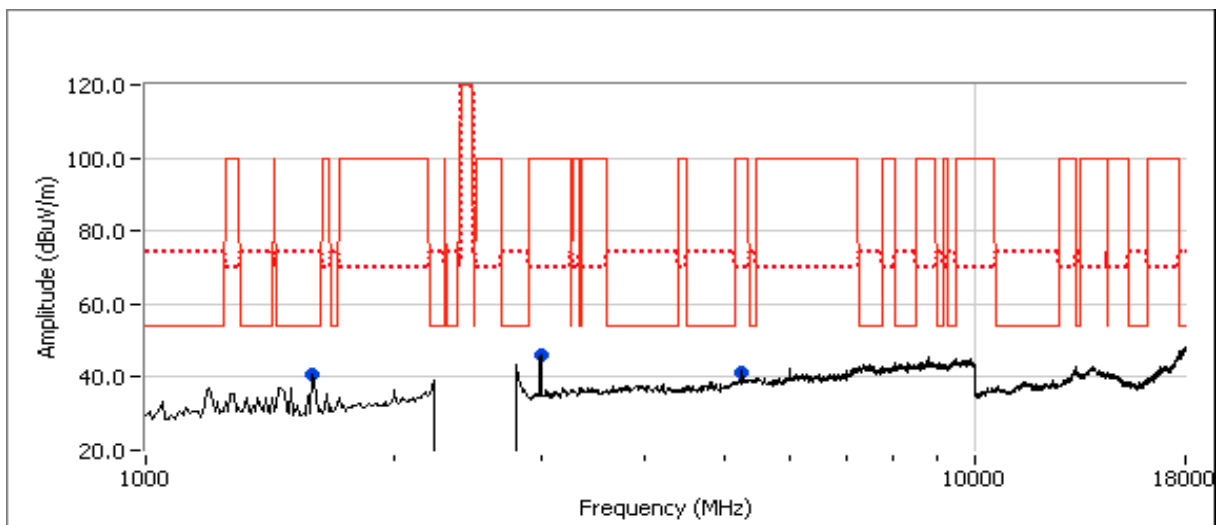
Run # 2a, EUT on Channel 2402MHz - EDR (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | PK/QP/Avg | degrees | meters |                              |
| 2994.650  | 46.1         | V   | 54.0          | -7.9   | AVG       | 111     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5241.070  | 37.0         | V   | 54.0          | -17.0  | AVG       | 162     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 1581.220  | 33.8         | H   | 54.0          | -20.2  | AVG       | 350     | 1.9    | RB 1 MHz;VB 10 Hz;Pk         |
| 5238.500  | 51.5         | V   | 74.0          | -22.5  | PK        | 162     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 2994.520  | 49.0         | V   | 74.0          | -25.0  | PK        | 111     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1582.230  | 35.6         | H   | 74.0          | -38.4  | PK        | 350     | 1.9    | RB 1 MHz;VB 3 MHz;Pk         |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



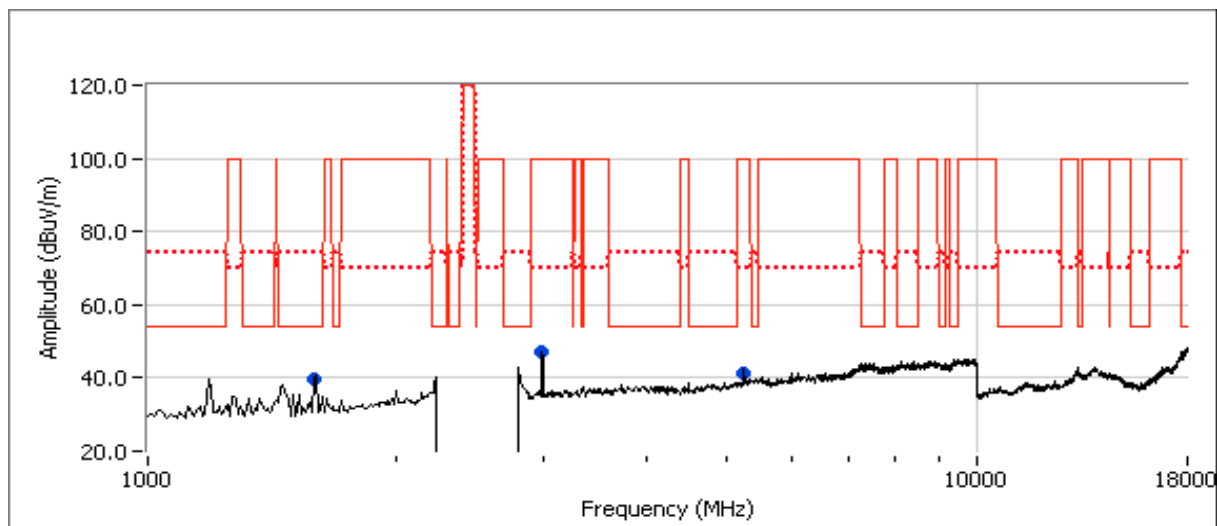
|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 2b: , EUT on Channel 2440MHz - EDR (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.690  | 45.9         | V   | 54.0          | -8.1   | AVG       | 118     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 5233.080  | 33.3         | V   | 54.0          | -20.7  | AVG       | 171     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 3 |
| 2994.640  | 49.1         | V   | 74.0          | -24.9  | PK        | 118     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1586.960  | 28.7         | V   | 54.0          | -25.3  | AVG       | 237     | 1.0    | RB 1 MHz;VB 10 Hz;Pk         |
| 5233.100  | 44.4         | V   | 74.0          | -29.6  | PK        | 171     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 3 |
| 1586.030  | 36.6         | V   | 74.0          | -37.4  | PK        | 237     | 1.0    | RB 1 MHz;VB 3 MHz;Pk         |

|         |                                                                                                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.                       |
| Note 2: | Scans made between 18 - 26GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 3: | Emission in non-restricted band, used restricted band limit of 15.209.                                                                                                                          |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

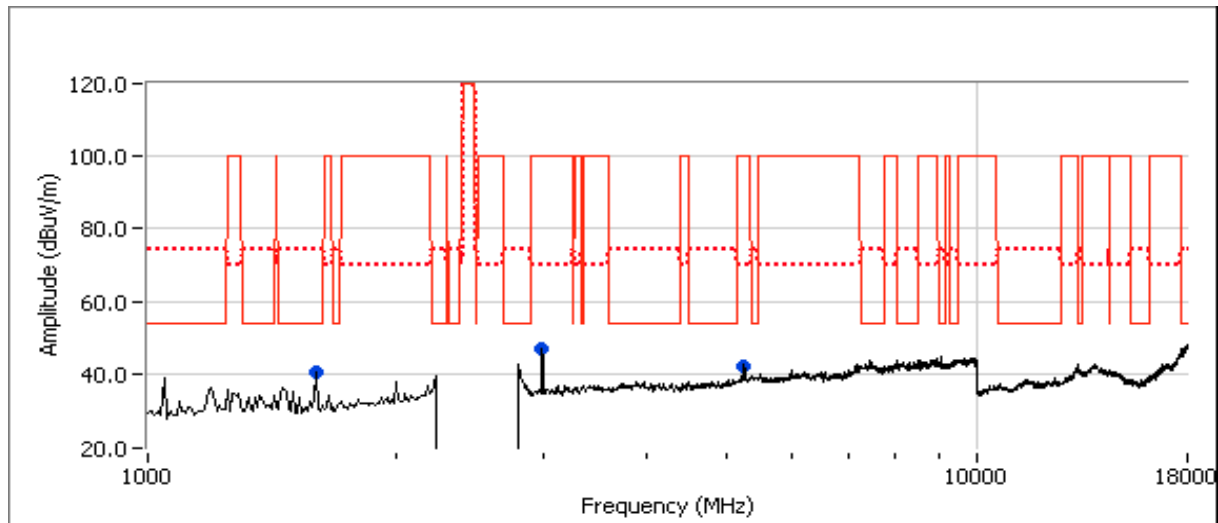
Run # 2c: , EUT on Channel 2480MHz - Basic (3 Mb/s), Chain A

## Spurious Radiated Emissions:

| Frequency | Level        | Pol | 15.209/15.247 |        | Detector  | Azimuth | Height | Comments                     |
|-----------|--------------|-----|---------------|--------|-----------|---------|--------|------------------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit         | Margin | Pk/QP/Avg | degrees | meters |                              |
| 2994.680  | 46.1         | V   | 54.0          | -7.9   | AVG       | 118     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 5240.010  | 33.9         | V   | 54.0          | -20.1  | AVG       | 172     | 1.0    | RB 1 MHz;VB 10 Hz;Pk, note 2 |
| 2994.820  | 49.1         | V   | 74.0          | -24.9  | PK        | 118     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |
| 1596.820  | 26.6         | V   | 54.0          | -27.4  | AVG       | 305     | 1.3    | RB 1 MHz;VB 10 Hz;Pk         |
| 1598.280  | 46.6         | V   | 74.0          | -27.4  | PK        | 305     | 1.3    | RB 1 MHz;VB 3 MHz;Pk         |
| 5241.250  | 45.8         | V   | 74.0          | -28.2  | PK        | 172     | 1.0    | RB 1 MHz;VB 3 MHz;Pk, note 2 |

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Emission in non-restricted band, used restricted band limit of 15.209.



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

Run # 3, Radiated Spurious Emissions, 1-7.5GHz, Receive, Chain A

Date of Test: 10/12/2011

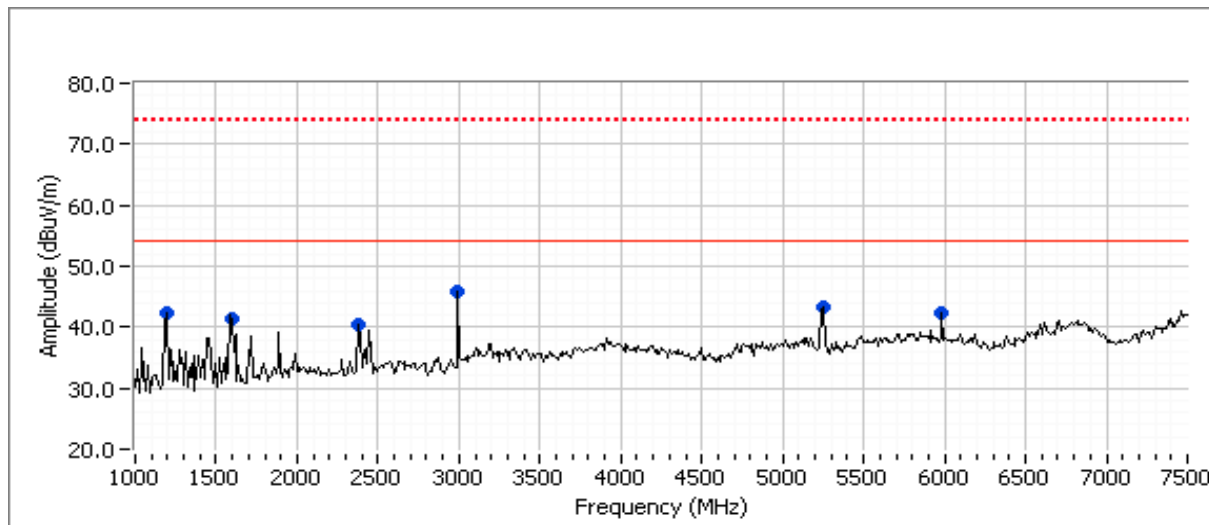
Test Location: FT Chamber#4

Test Engineer: Joseph Cadigal

Config Change: none

Run # 3a, EUT on Channel #6 2437MHz - Receive, Chain A

| Frequency | Level        | Pol | RSS 210 |        | Detector  | Azimuth | Height | Comments             |
|-----------|--------------|-----|---------|--------|-----------|---------|--------|----------------------|
| MHz       | dB $\mu$ V/m | v/h | Limit   | Margin | Pk/QP/Avg | degrees | meters |                      |
| 2994.680  | 45.0         | V   | 54.0    | -9.0   | AVG       | 192     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 5242.080  | 37.4         | V   | 54.0    | -16.6  | AVG       | 185     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1197.990  | 35.5         | V   | 54.0    | -18.5  | AVG       | 185     | 1.6    | RB 1 MHz;VB 10 Hz;Pk |
| 5974.470  | 33.5         | V   | 54.0    | -20.5  | AVG       | 163     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 5244.150  | 52.3         | V   | 74.0    | -21.7  | PK        | 185     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1196.320  | 50.0         | V   | 74.0    | -24.0  | PK        | 185     | 1.6    | RB 1 MHz;VB 3 MHz;Pk |
| 2994.700  | 49.5         | V   | 74.0    | -24.5  | PK        | 192     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2364.500  | 27.9         | V   | 54.0    | -26.1  | AVG       | 349     | 1.0    | RB 1 MHz;VB 10 Hz;Pk |
| 1592.100  | 26.6         | V   | 54.0    | -27.4  | AVG       | 1       | 1.6    | RB 1 MHz;VB 10 Hz;Pk |
| 5976.940  | 45.7         | V   | 74.0    | -28.3  | PK        | 163     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 2365.600  | 39.4         | V   | 74.0    | -34.6  | PK        | 349     | 1.0    | RB 1 MHz;VB 3 MHz;Pk |
| 1593.060  | 37.4         | V   | 74.0    | -36.6  | PK        | 1       | 1.6    | RB 1 MHz;VB 3 MHz;Pk |



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## FCC 15.247 FHSS - Power, Bandwidth and Spurious Emissions

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

### Ambient Conditions:

Temperature: 22 °C  
Rel. Humidity: 37 %

### Summary of Results

| Run # | Test Performed                                | Limit                | Pass / Fail | Result / Margin                                                                           |
|-------|-----------------------------------------------|----------------------|-------------|-------------------------------------------------------------------------------------------|
| 1     | 30 - 26500 MHz - Conducted Spurious Emissions | FCC Part 15.247( c ) | Pass        | All emissions < -20 dBc                                                                   |
| 2     | Output Power                                  | 15.247(b)            | Pass        | -3.05 dBm ( .00049545 W)                                                                  |
| 3     | 20dB Bandwidth                                | 15.247(a)            | Pass        | 1.111kHz                                                                                  |
| 3     | 99% bandwidth                                 | 15.247(a)            | Pass        | 918kHz                                                                                    |
| 3     | Number of Channels                            | 15.247(a)            | Pass        | Device complies with the Bluetooth 2 specifications with a minimum of 20 hopping channels |
| 4     | Channel Occupancy                             | 15.247(a)            | Pass        |                                                                                           |

### Modifications Made During Testing:

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

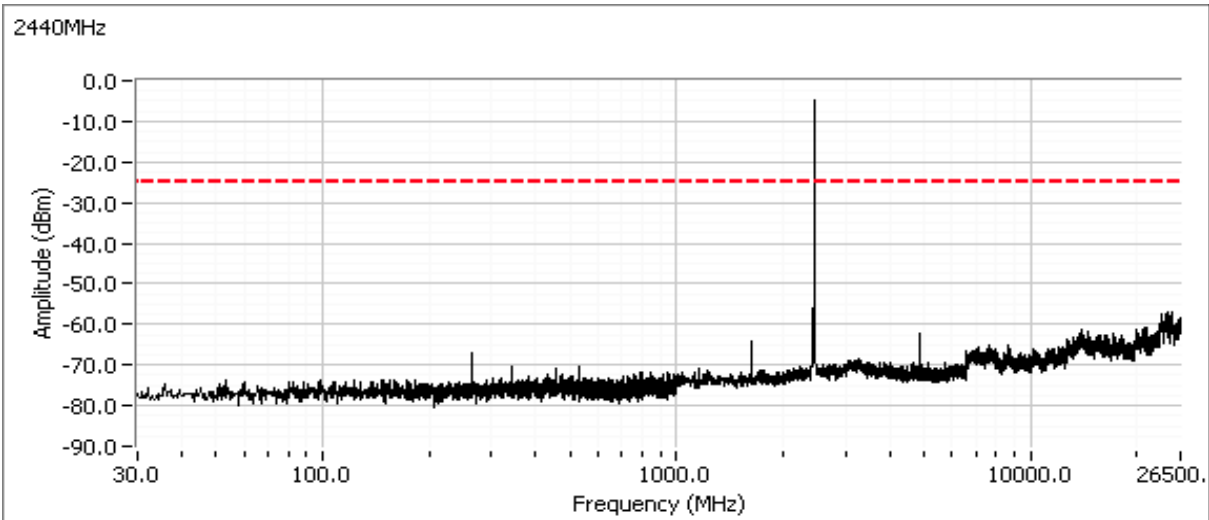
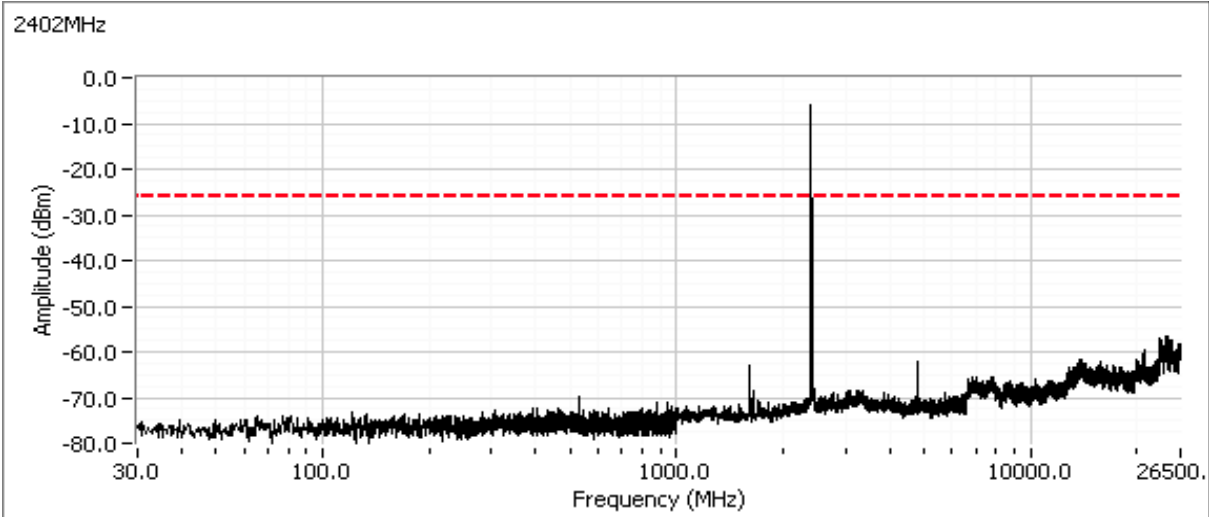
Run #1: Antenna Conducted Spurious Emissions, 30 - 26500 MHz.

Date of Test: 10/13/2011

Test Engineer: Joseph Cadigal

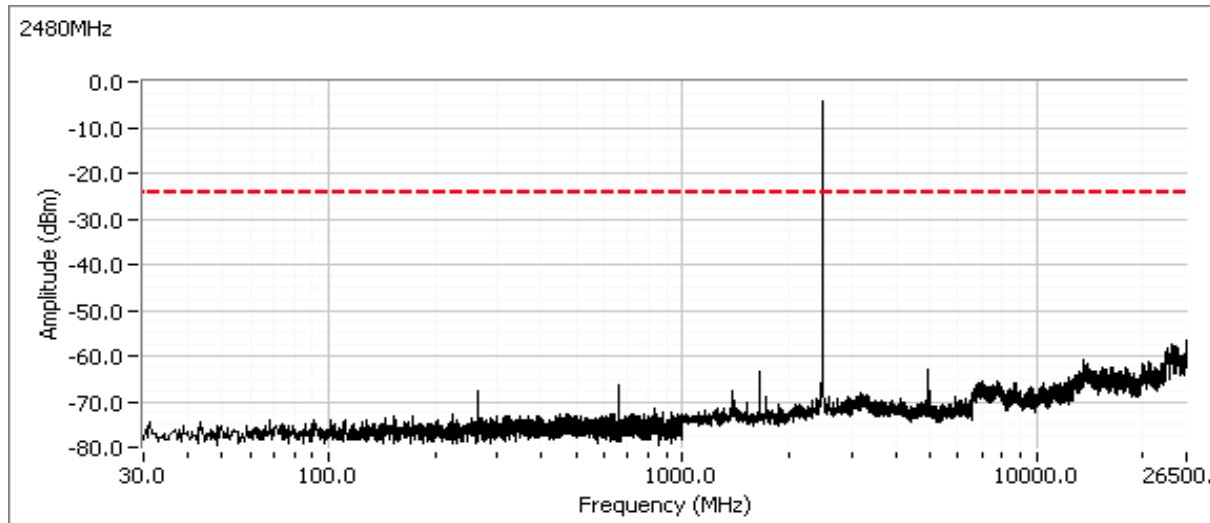
Test Location: FT EMC Lab#4

Refer to plots below. Scans made using RBW=VB=100 KHz with the limit line set at 20dB below the highest in-band signal level.





|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



## Run #2: Output Power

Date of Test: 10/13/2011

Test Engineer: Joseph Cadigal

Test Location: FT EMC Lab#4

For frequency hopping systems in the 2400-2483.5 MHz band employing less than 75 channels the maximum allowed output power is 0.125 watts.

Maximum antenna gain: 3 dBi

| Channel | Frequency (MHz) | Res BW | Output Power (dBm) | Output Power (W) | EIRP (W)  |
|---------|-----------------|--------|--------------------|------------------|-----------|
| Low     | 2402            |        | -4.30              | 0.000371535      | 0.0007413 |
| Mid     | 2441            |        | -3.32              | 0.000465586      | 0.0004656 |
| High    | 2480            |        | -3.05              | 0.00049545       | 0.0004955 |

Note 1: Output power measured using a peak power meter, spurious limit is -20dBc.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run #3: Bandwidth, Spacing and Number of Channels

Date of Test: 10/13/2011

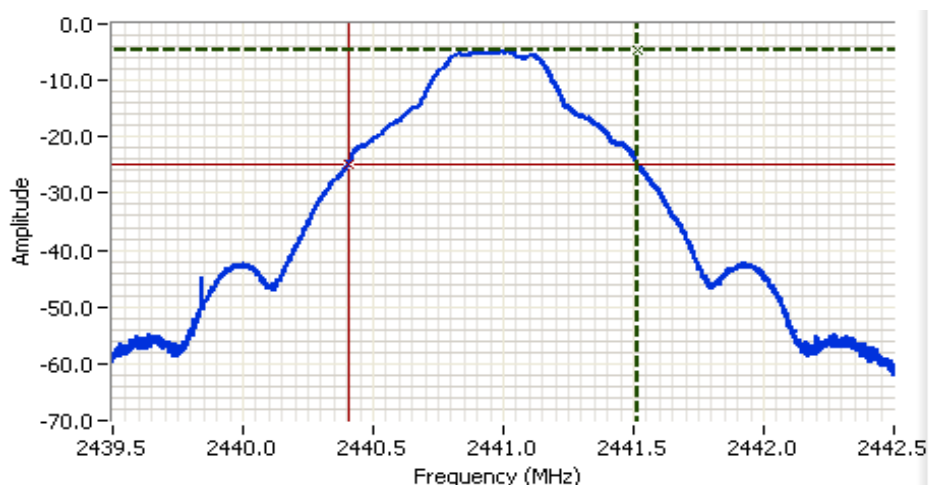
Test Engineer: Joseph Cadigal

Test Location: FT EMC Lab#4

| Channel | Frequency (MHz) | Resolution Bandwidth | 20dB Bandwidth (kHz) | Resolution Bandwidth | 99% Bandwidth (kHz) |
|---------|-----------------|----------------------|----------------------|----------------------|---------------------|
| Low     | 2402            | 100kHz               | 1.105                | 50kHz                | 917                 |
| Mid     | 2441            | 100kHz               | 1.111                | 50kHz                | 918                 |
| High    | 2480            | 100kHz               | 1.107                | 50kHz                | 912                 |

Note 1: 20dB bandwidth measured using RB = 100kHz, VB = 100kHz (VB > RB)

Note 2: 99% bandwidth measured using RB = 50kHz, VB = 150kHz (VB >= 3RB)



### Analyzer Settings

Agilent Technologies, E4446A  
CF: 2441.000 MHz  
SPAN: 3.000 MHz  
RB: 100 kHz  
VB: 100 kHz  
Detector: POS  
Attn: 10 DB  
RL Offset: 10.5 DB  
Sweep Time: 50.2ms  
Ref Lvl: 0.0 DBM

### Comments

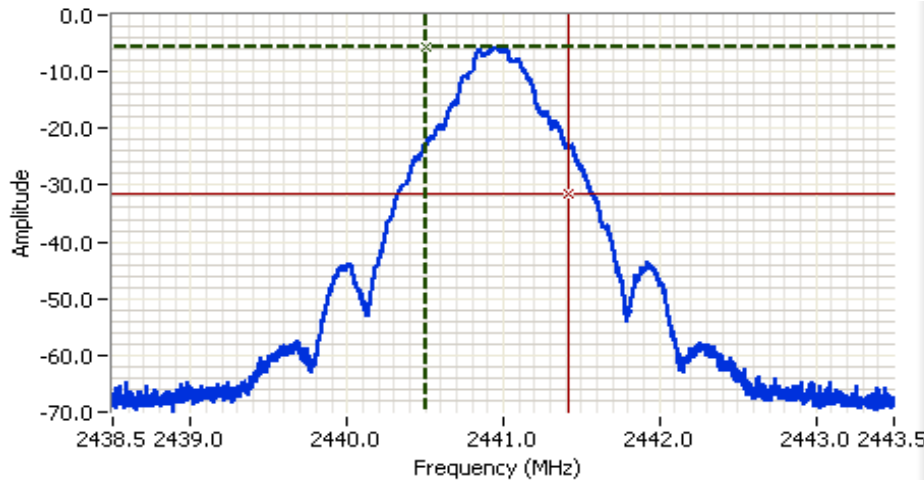
20dB BW: 1.111 MHz

|          |           |        |  |
|----------|-----------|--------|--|
| Cursor 1 | 2441.5157 | -4.80  |  |
| Cursor 2 | 2440.4043 | -24.80 |  |

Delta Freq. 1.111

Delta Amplitude 20.00

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



**Analyzer Settings**  
 Agilent Technologies, E4446A  
 CF: 2441.000 MHz  
 SPAN: 5.000 MHz  
 RB: 51.0 kHz  
 VB: 150 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 10.5 DB  
 Sweep Time: 50.2ms  
 Ref Lvl: 0.0 DBm

**Comments**  
 99% power BW: 918 kHz  
 Power over span: 2.01dBm

Cursor 1 2440.5017 -5.52  
 Cursor 2 2441.4200 -31.52

Delta Freq. 918 kHz  
 Delta Amplitude 26.00



## Run #4: Channel Spacing and Number of Channels

### Basic Mode

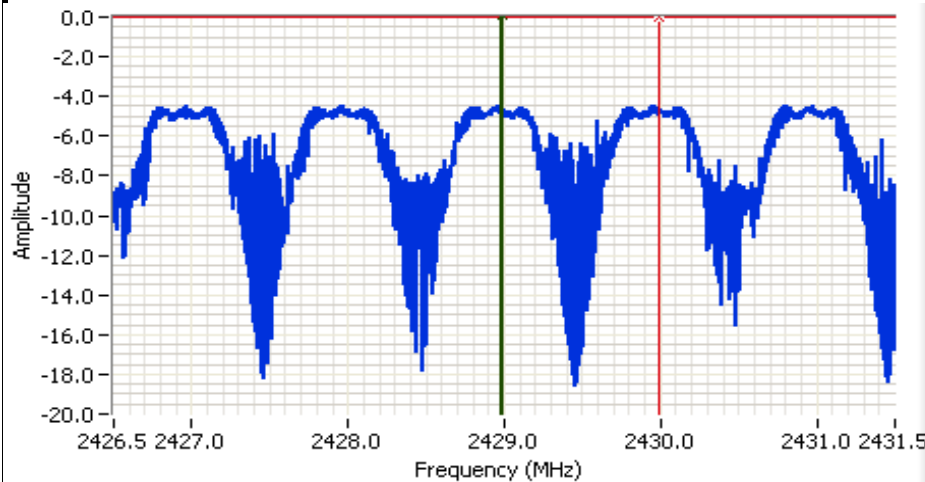
Channel Spacing: 1000 kHz  
 20dB Bandwidth: 1111 kHz

The channel spacing was measured in Basic rate mode with hopping enabled - see plot below showing channel spacing:  
 The channel spacing shall be greater than 2/3 times the widest 20dB bandwidth, as the output power is <0.125W.

Number of channels: 79 Max 20 Min (AFH enabled)

The number of channels was measured in Basic rate mode with hopping enabled with both the maximum (all) channels enabled and with the minimum number of channels enabled. The system shall employ a minimum of 15 hopping channels.

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

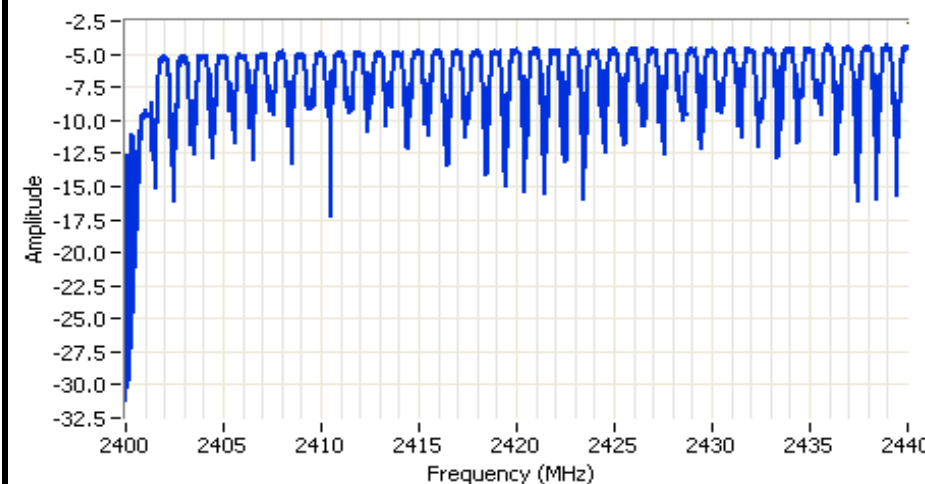


**Analyzer Settings**

Agilent Technologies, E4446A  
 CF: 2429.000 MHz  
 SPAN: 5.000 MHz  
 RB: 300 kHz  
 VB: 100 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 10.5 DB  
 Sweep Time: 50.2ms  
 Ref Lvl: 0.0 DBM

**Comments**

channel spacing: 1.00MHz



**Analyzer Settings**

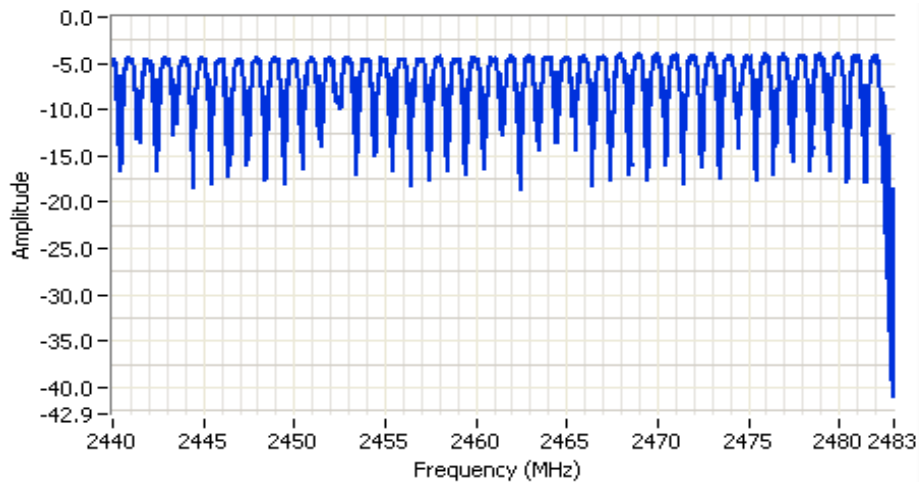
Agilent Technologies, E4446A  
 CF: 2420.000 MHz  
 SPAN: 40.000 MHz  
 RB: 300 kHz  
 VB: 100 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 10.5 DB  
 Sweep Time: 50.2ms  
 Ref Lvl: 0.0 DBM

**Comments**

Number of channels  
 Part 1: 38



|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |



## Analyzer Settings

Agilent Technologies, E4446A  
 CF: 2461.500 MHz  
 SPAN: 43.000 MHz  
 RB: 300 kHz  
 VB: 100 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 10.5 DB  
 Sweep Time: 50.2ms  
 Ref Lvl: 0.0 DBM

## Comments

Number of channels  
 Part 2: 41

2483.1120 1.71   

0.0000 0.00   

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## FCC 15.247 FHSS - Power, Bandwidth and Spurious Emissions

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/19/2011 0:00  
Test Engineer: Mark Hill / Joseph Cadigal  
Test Location: FT Chamber#5

Config. Used: 1  
Config Change: none  
EUT Voltage: 120V/60Hz

### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

### Ambient Conditions:

Temperature: 22 °C  
Rel. Humidity: 37 %

### Summary of Results

| Run # | Test Performed                                | Limit                | Pass / Fail | Result / Margin                                                                           |
|-------|-----------------------------------------------|----------------------|-------------|-------------------------------------------------------------------------------------------|
| 1     | 30 - 26500 MHz - Conducted Spurious Emissions | FCC Part 15.247( c ) | Pass        | All emissions < -20 dBc                                                                   |
| 2     | Output Power                                  | 15.247(b)            | Pass        | -2.14 dBm ( .000310942 W)                                                                 |
| 3     | 20dB Bandwidth                                | 15.247(a)            | Pass        | 1.47MHz                                                                                   |
| 3     | 99% bandwidth                                 | 15.247(a)            | Pass        | 1.223MHz                                                                                  |
| 3     | Number of Channels                            | 15.247(a)            | Pass        | Device complies with the Bluetooth 2 specifications with a minimum of 20 hopping channels |
| 4     | Channel Occupancy                             | 15.247(a)            | Pass        |                                                                                           |

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Modifications Made During Testing:

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Antenna Conducted Spurious Emissions, 30 - 26500 MHz.

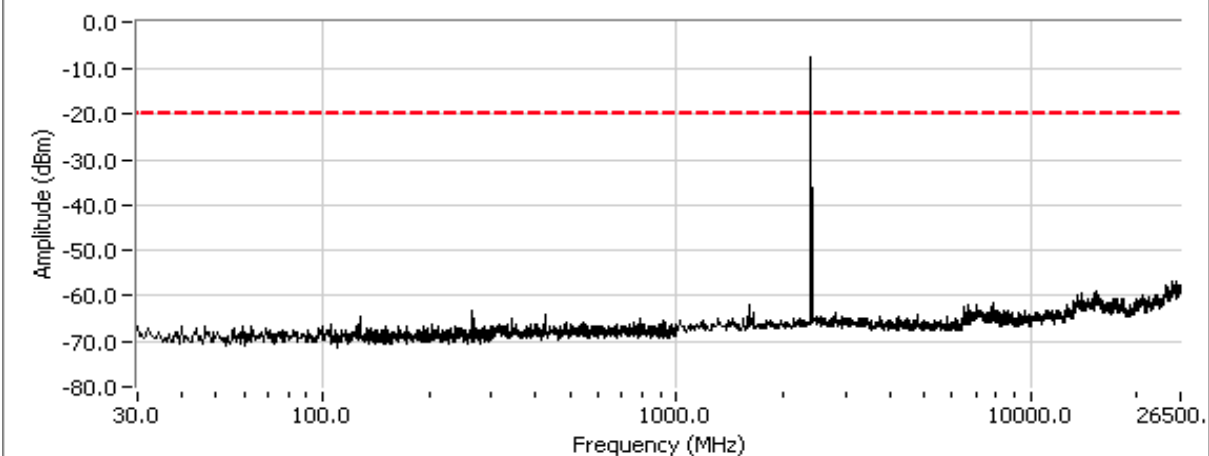
Date of Test: 10/19/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#5

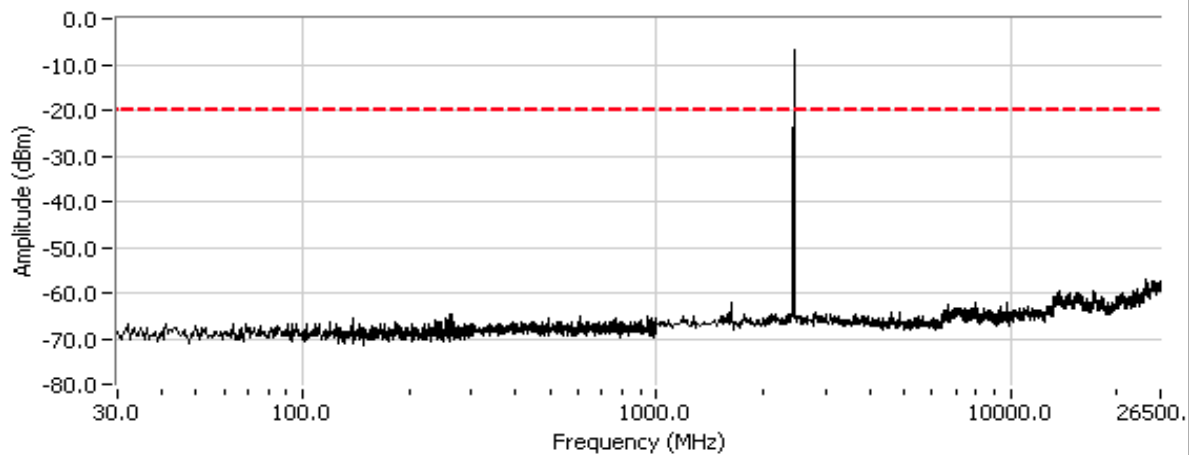
Refer to plots below. Scans made using RBW=VB=100 KHz with the limit line set at 20dB below the highest in-band signal level.

2402MHz EDR

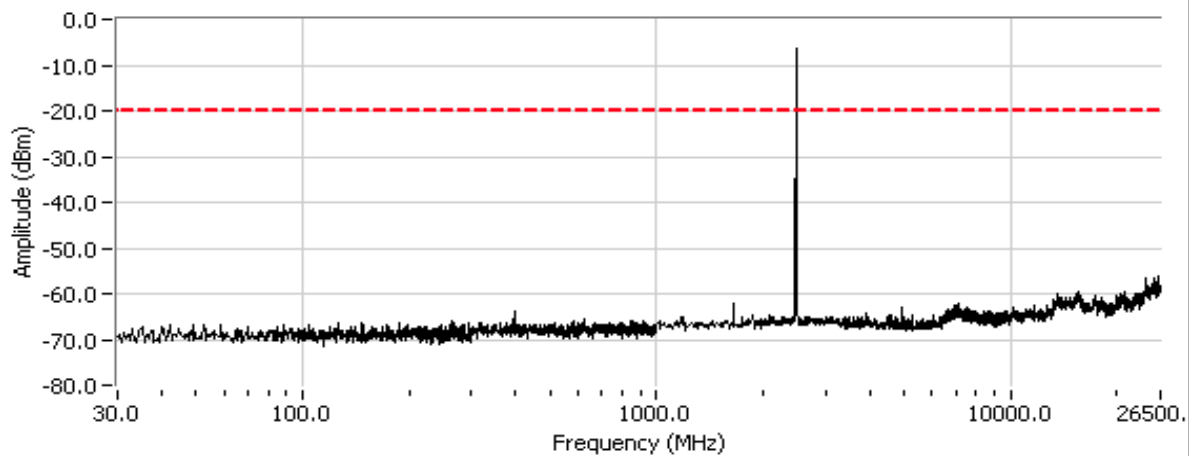


|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

2440MHz EDR



2480MHz EDR





|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run #2: Output Power

Date of Test: 10/19/2011

Test Engineer: Joseph Cadigal

Test Location: FT Chamber#5

For frequency hopping systems in the 2400-2483.5 MHz band employing less than 75 channels the maximum allowed output power is 0.125 watts.

Maximum antenna gain: 3 dBi

| Channel | Frequency (MHz) | Res BW | Output Power (dBm) | Output Power (W) | EIRP (W)  |
|---------|-----------------|--------|--------------------|------------------|-----------|
| Low     | 2402            |        | -2.14              | 0.000610942      | 0.001219  |
| Mid     | 2440            |        | -1.53              | 0.000703072      | 0.0007031 |
| High    | 2480            |        | -1.27              | 0.000746449      | 0.0007464 |

Note 1: Output power measured using a peak power meter, spurious limit is -20dBc.

## Run #3: Bandwidth, Spacing and Number of Channels

Date of Test: 10/19/2011

Test Engineer: Joseph Cadigal

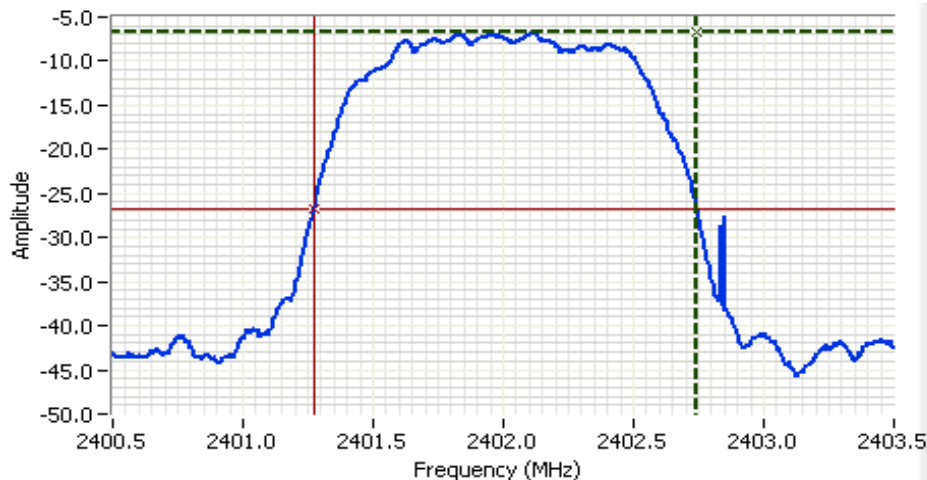
Test Location: FT Chamber#5

| Channel | Frequency (MHz) | Resolution Bandwidth | 20dB Bandwidth (kHz) | Resolution Bandwidth | 99% Bandwidth (kHz) |
|---------|-----------------|----------------------|----------------------|----------------------|---------------------|
| Low     | 2402            | 100kHz               | 1.47                 | 50kHz                | 1.223MHz            |
| Mid     | 2440            | 100kHz               | 1.465                | 50kHz                | 1.215MHz            |
| High    | 2480            | 100kHz               | 1.455                | 50kHz                | 1.223MHz            |

Note 1: 20dB bandwidth measured using RB = 100kHz, VB = 100kHz (VB > RB)

Note 2: 99% bandwidth measured using RB = 50kHz, VB = 150kHz (VB >= 3RB)

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

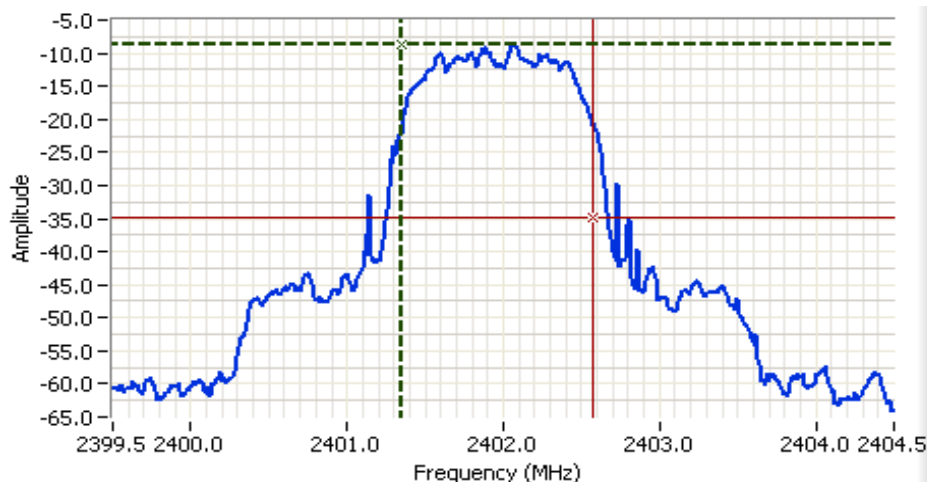


## Analyzer Settings

HP8564E  
CF: 2402.000 MHz  
SPAN: 3.000 MHz  
RB: 100 kHz  
VB: 100 kHz  
Detector: POS  
Attn: 10 DB  
RL Offset: 11.0 DB  
Sweep Time: 50.0ms  
Ref Lvl: 10.5 DBM

## Comments

20dB BW: 1.470 MHz



## Analyzer Settings

Agilent Technologies, E4446A  
CF: 2402.000 MHz  
SPAN: 5.000 MHz  
RB: 51.0 kHz  
VB: 150 kHz  
Detector: POS  
Attn: 10 DB  
RL Offset: 10.5 DB  
Sweep Time: 50.0ms  
Ref Lvl: 10.5 DBM

## Comments

99% power BW: 1.223 MHz  
Power over span: 1.87dBm

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

## Run #4: Channel Spacing and Number of Channels

### Basic Mode

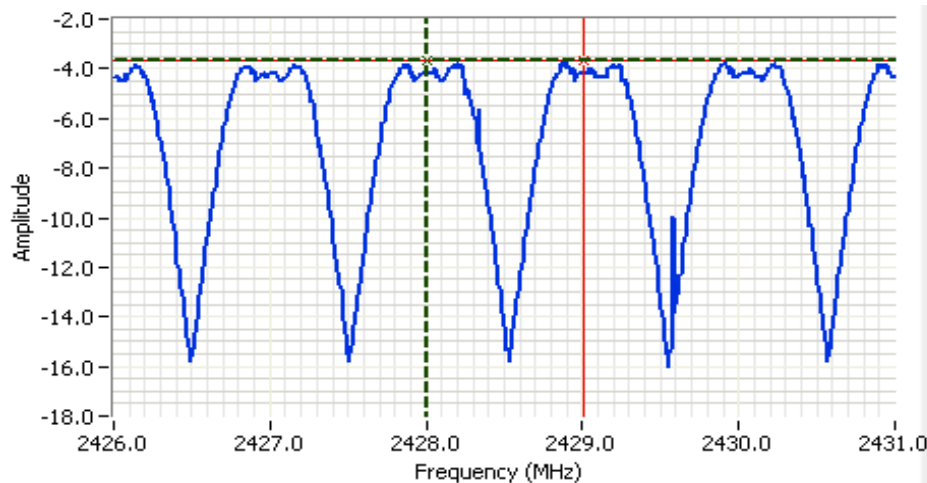
Channel Spacing: 1000 kHz

20dB Bandwidth: 1470 kHz

The channel spacing was measured in Basic rate mode with hopping enabled - see plot below showing channel spacing:  
The channel spacing shall be greater than 2/3 times the widest 20dB bandwidth, as the output power is <0.125W.

Number of channels: 79 Max 20 Min (AFH enabled)

The number of channels was measured in Basic rate mode with hopping enabled with both the maximum (all) channels enabled and with the minimum number of channels enabled. The system shall employ a minimum of 15 hopping channels.



### Analyzer Settings

HP8564E  
CF: 2428.500 MHz  
SPAN: 5.000 MHz  
RB: 300 kHz  
VB: 100 kHz  
Detector: POS  
Attn: 10 DB  
RL Offset: 11.0 DB  
Sweep Time: 50.0ms  
Ref Lvl: 10.5 DBM

### Comments

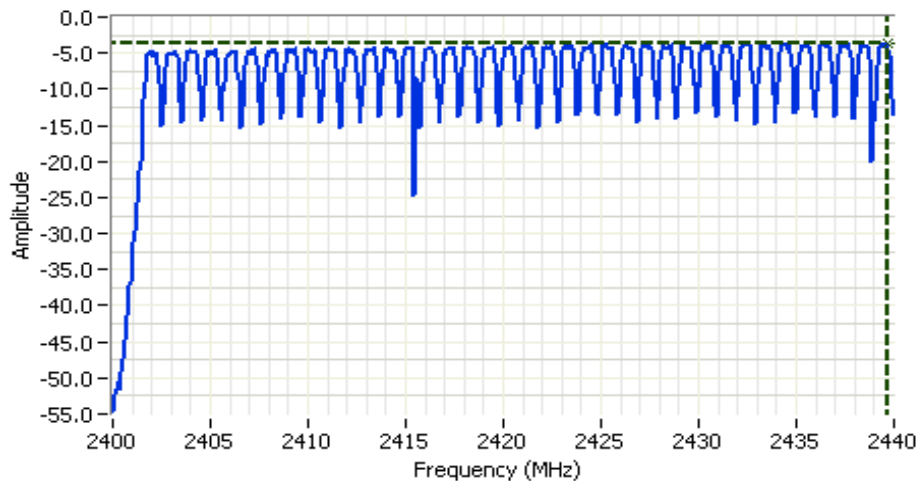
channel spacing: 1.00MHz

|          |           |       |  |
|----------|-----------|-------|--|
| Cursor 1 | 2428.0052 | -3.67 |  |
| Cursor 1 | 2429.0078 | -3.67 |  |

Delta Freq. 1.003

Delta Amplitude 0.00

|           |                                      |                  |                   |
|-----------|--------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications           | Job Number:      | J78403            |
| Model:    | SDC-WB40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83113            |
| Contact:  | Ron Seide                            | Account Manager: | Christine Krebill |
| Standard: | FCC 15.247/RSS-210                   | Class:           | N/A               |

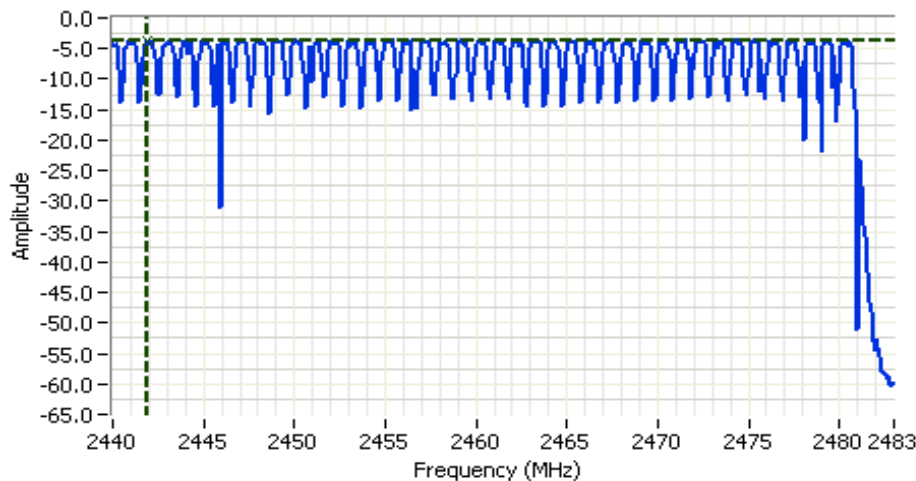
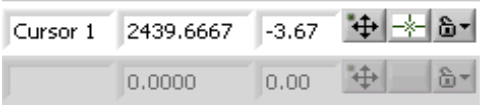


## Analyzer Settings

HP8564E  
 CF: 2420.000 MHz  
 SPAN: 40.000 MHz  
 RB: 300 kHz  
 VB: 100 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 11.0 DB  
 Sweep Time: 50.0ms  
 Ref Lvl: 10.5 DBM

## Comments

Number of channels  
 Part 1: 38

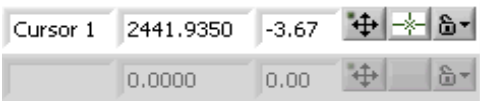


## Analyzer Settings

HP8564E  
 CF: 2461.500 MHz  
 SPAN: 43.000 MHz  
 RB: 300 kHz  
 VB: 100 kHz  
 Detector: POS  
 Attn: 10 DB  
 RL Offset: 11.0 DB  
 Sweep Time: 50.0ms  
 Ref Lvl: 10.5 DBM

## Comments

Munber of channels  
 Part 2: 41



|                        |                                                    |                  |                   |
|------------------------|----------------------------------------------------|------------------|-------------------|
| Client:                | Summit Data Communications                         | Job Number:      | J78403            |
| Model:                 | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:               | Ron Seide                                          | Account Manager: | Christine Krebill |
| Emissions Standard(s): | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |
| Immunity Standard(s):  | EN 301 489-1 V1.8.1                                | Environment:     | -                 |

## EMC Test Data

For The

### Summit Data Communications

Model

SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1)

Date of Last Test: 12/16/2011

|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

## Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

### Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 12/16/2011  
Test Engineer: John Caizzi  
Test Location: Fremont Chamber #5

Config. Used: 2  
Config Change: none  
Host Unit Voltage 120V / 60Hz & 230V / 50Hz

### General Test Configuration

For tabletop equipment, the EUT host system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. The EUT was transmitting on 2437 MHz, 802.11g, 6 Mbps.

Ambient Conditions:                      Temperature:                      21 °C  
                                                                                 Rel. Humidity:                      33 %

### Summary of Results

| Run # | Test Performed          | Limit   | Result | Margin                         |
|-------|-------------------------|---------|--------|--------------------------------|
| 1     | CE, AC Power, 230V/50Hz | Class B | Pass   | 31.0dBµV @ 0.687MHz (-15.0dB)  |
| 2     | CE, AC Power, 120V/60Hz | Class B | Pass   | 31.9dBµV @ 19.501MHz (-18.1dB) |

### Modifications Made During Testing

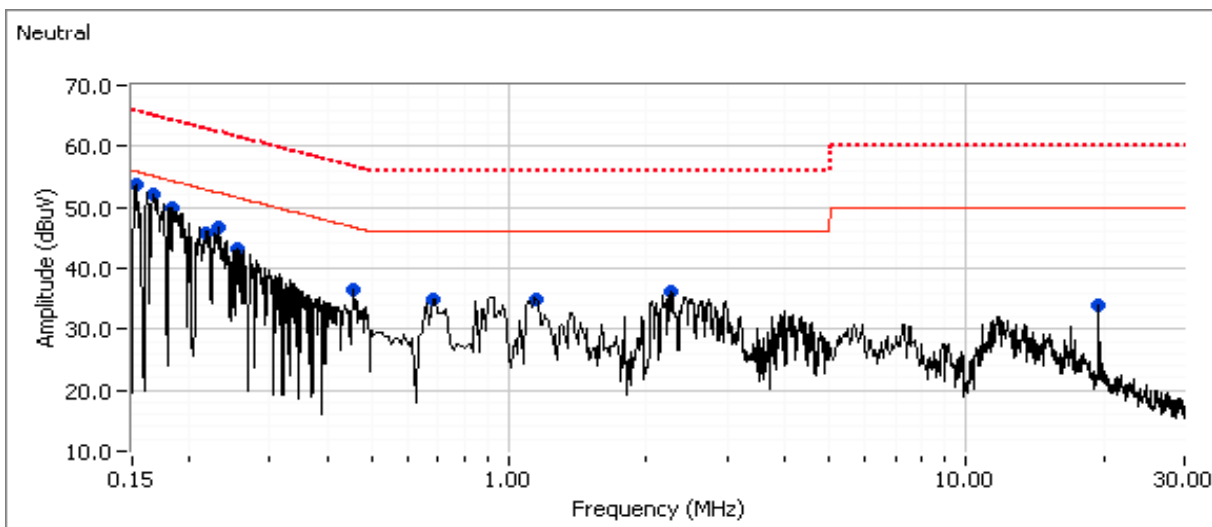
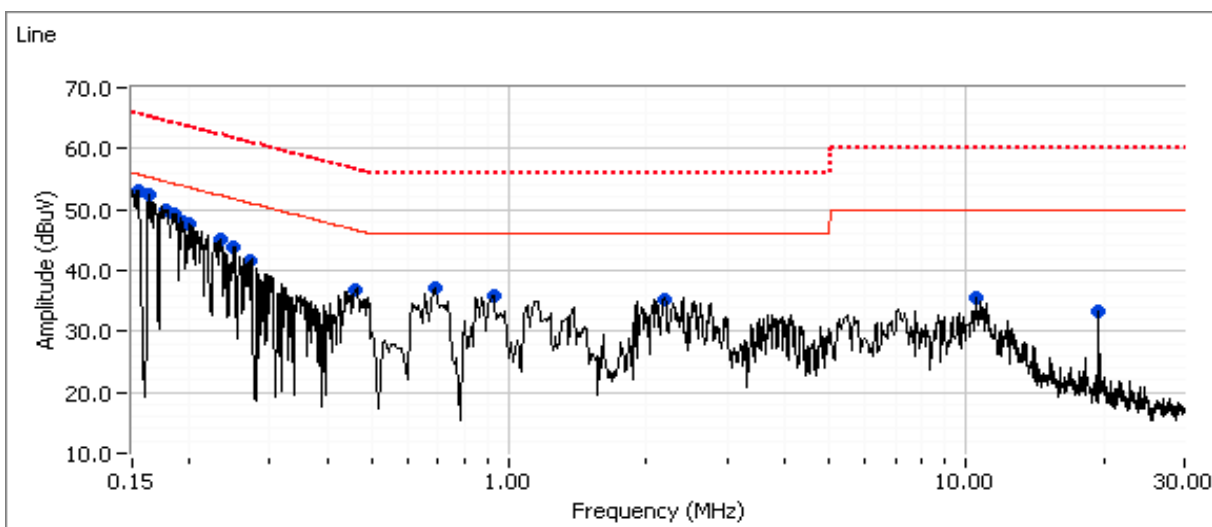
No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz



|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

| Frequency<br>MHz | Level<br>dBμV | AC<br>Line | Class B |        | Detector<br>QP/Ave | Comments |
|------------------|---------------|------------|---------|--------|--------------------|----------|
|                  |               |            | Limit   | Margin |                    |          |
| 0.153            | 53.0          | Line       | 55.8    | -2.8   | Peak               |          |
| 0.163            | 52.3          | Line       | 55.3    | -3.0   | Peak               |          |
| 0.178            | 49.8          | Line       | 54.6    | -4.8   | Peak               |          |
| 0.185            | 49.1          | Line       | 54.3    | -5.2   | Peak               |          |
| 0.195            | 48.1          | Line       | 53.9    | -5.8   | Peak               |          |
| 0.202            | 47.6          | Line       | 53.6    | -6.0   | Peak               |          |
| 0.234            | 45.1          | Line       | 52.3    | -7.2   | Peak               |          |
| 0.250            | 43.9          | Line       | 51.7    | -7.8   | Peak               |          |
| 0.687            | 37.0          | Line       | 46.0    | -9.0   | Peak               |          |
| 0.271            | 41.5          | Line       | 51.1    | -9.6   | Peak               |          |
| 0.464            | 36.9          | Line       | 46.6    | -9.7   | Peak               |          |
| 0.916            | 35.9          | Line       | 46.0    | -10.1  | Peak               |          |
| 2.173            | 35.2          | Line       | 46.0    | -10.8  | Peak               |          |
| 10.533           | 35.6          | Line       | 50.0    | -14.4  | Peak               |          |
| 19.501           | 33.3          | Line       | 50.0    | -16.7  | Peak               |          |
| 0.153            | 53.7          | Neutral    | 55.8    | -2.1   | Peak               |          |
| 0.167            | 52.1          | Neutral    | 55.1    | -3.0   | Peak               |          |
| 0.185            | 49.8          | Neutral    | 54.3    | -4.5   | Peak               |          |
| 0.232            | 46.7          | Neutral    | 52.4    | -5.7   | Peak               |          |
| 0.217            | 45.8          | Neutral    | 52.9    | -7.1   | Peak               |          |
| 0.255            | 43.2          | Neutral    | 51.6    | -8.4   | Peak               |          |
| 2.279            | 36.3          | Neutral    | 46.0    | -9.7   | Peak               |          |
| 0.458            | 36.6          | Neutral    | 46.7    | -10.1  | Peak               |          |
| 0.685            | 35.0          | Neutral    | 46.0    | -11.0  | Peak               |          |
| 1.141            | 34.8          | Neutral    | 46.0    | -11.2  | Peak               |          |
| 19.502           | 34.0          | Neutral    | 50.0    | -16.0  | Peak               |          |



|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

## Final quasi-peak and average readings

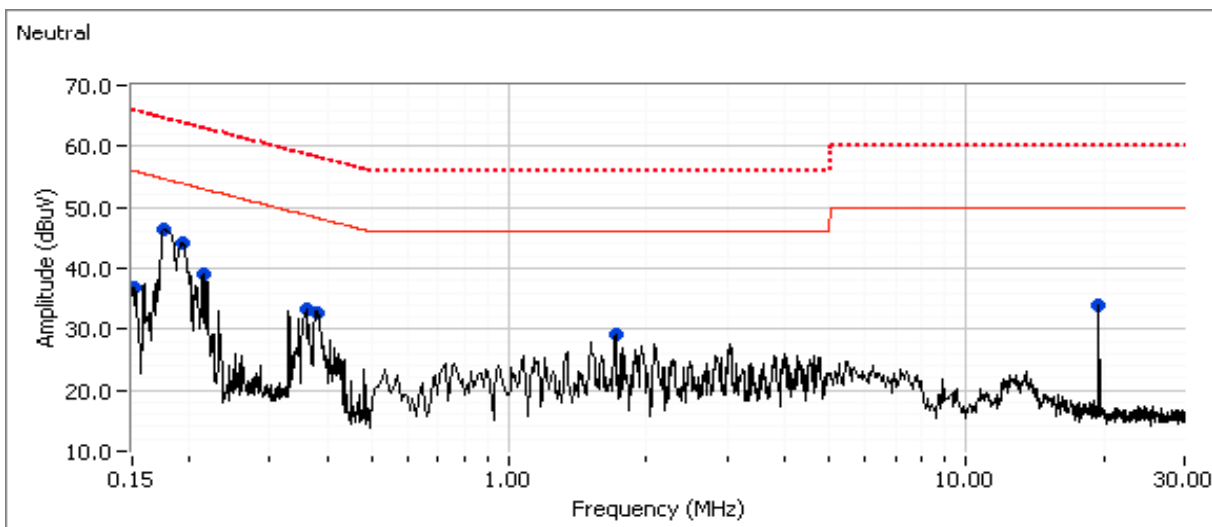
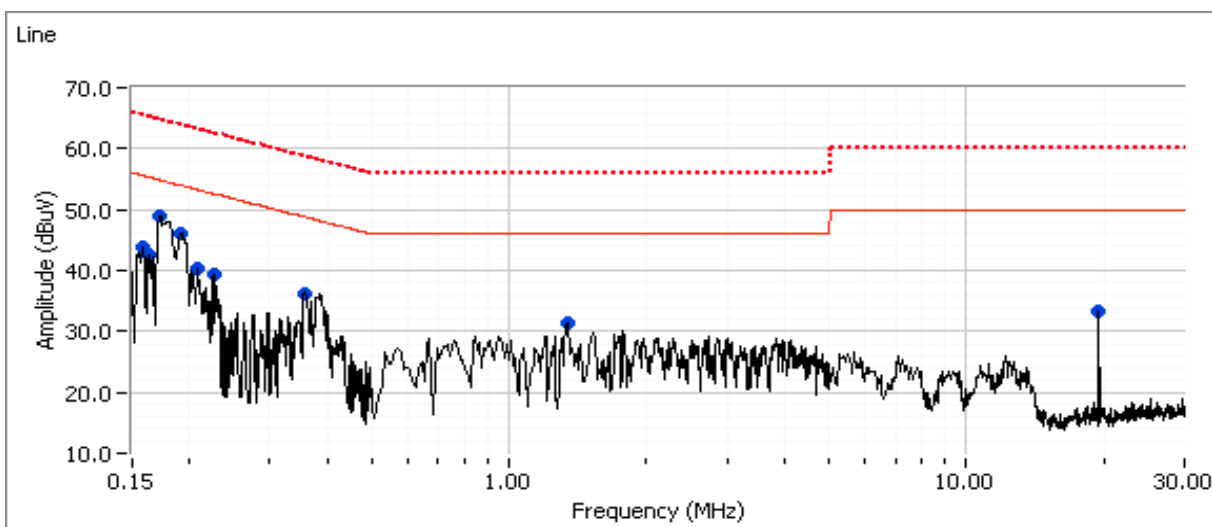
| Frequency<br>MHz | Level<br>dBμV | AC<br>Line | Class B |        | Detector<br>QP/Ave | Comments |
|------------------|---------------|------------|---------|--------|--------------------|----------|
|                  |               |            | Limit   | Margin |                    |          |
| 0.153            | 17.5          | Line       | 55.8    | -38.3  | AVG                |          |
| 0.153            | 46.1          | Line       | 65.8    | -19.7  | QP                 |          |
| 0.163            | 16.8          | Line       | 55.3    | -38.5  | AVG                |          |
| 0.163            | 44.7          | Line       | 65.3    | -20.6  | QP                 |          |
| 0.178            | 16.1          | Line       | 54.6    | -38.5  | AVG                |          |
| 0.178            | 42.8          | Line       | 64.6    | -21.8  | QP                 |          |
| 0.185            | 15.9          | Line       | 54.3    | -38.4  | AVG                |          |
| 0.185            | 41.8          | Line       | 64.3    | -22.5  | QP                 |          |
| 0.195            | 15.7          | Line       | 53.8    | -38.1  | AVG                |          |
| 0.195            | 40.8          | Line       | 63.8    | -23.0  | QP                 |          |
| 0.202            | 15.4          | Line       | 53.5    | -38.1  | AVG                |          |
| 0.202            | 40.1          | Line       | 63.5    | -23.4  | QP                 |          |
| 0.687            | 31.0          | Line       | 46.0    | -15.0  | AVG                |          |
| 0.687            | 36.5          | Line       | 56.0    | -19.5  | QP                 |          |
| 0.463            | 25.5          | Line       | 46.6    | -21.1  | AVG                |          |
| 0.463            | 34.1          | Line       | 56.6    | -22.5  | QP                 |          |
| 0.916            | 28.9          | Line       | 46.0    | -17.1  | AVG                |          |
| 0.916            | 34.9          | Line       | 56.0    | -21.1  | QP                 |          |
| 2.173            | 7.9           | Line       | 46.0    | -38.1  | AVG                |          |
| 2.173            | 33.6          | Line       | 56.0    | -22.4  | QP                 |          |
| 10.533           | 20.5          | Line       | 50.0    | -29.5  | AVG                |          |
| 10.533           | 30.6          | Line       | 60.0    | -29.4  | QP                 |          |
| 19.501           | 31.1          | Line       | 50.0    | -18.9  | AVG                |          |
| 19.501           | 32.0          | Line       | 60.0    | -28.0  | QP                 |          |
| 0.153            | 17.6          | Neutral    | 55.8    | -38.2  | AVG                |          |
| 0.153            | 46.2          | Neutral    | 65.8    | -19.6  | QP                 |          |
| 0.167            | 16.5          | Neutral    | 55.1    | -38.6  | AVG                |          |
| 0.167            | 44.3          | Neutral    | 65.1    | -20.8  | QP                 |          |
| 0.185            | 15.8          | Neutral    | 54.3    | -38.5  | AVG                |          |
| 0.185            | 42.1          | Neutral    | 64.3    | -22.2  | QP                 |          |
| 0.232            | 21.4          | Neutral    | 52.4    | -31.0  | AVG                |          |
| 0.232            | 37.5          | Neutral    | 62.4    | -24.9  | QP                 |          |
| 0.216            | 14.6          | Neutral    | 53.0    | -38.4  | AVG                |          |
| 0.216            | 39.2          | Neutral    | 63.0    | -23.8  | QP                 |          |
| 2.279            | 25.1          | Neutral    | 46.0    | -20.9  | AVG                |          |
| 2.279            | 32.6          | Neutral    | 56.0    | -23.4  | QP                 |          |
| 0.458            | 28.8          | Neutral    | 46.7    | -17.9  | AVG                |          |
| 0.458            | 33.8          | Neutral    | 56.7    | -22.9  | QP                 |          |

|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

| Frequency<br>MHz | Level<br>dBμV | AC<br>Line | Class B |        | Detector<br>QP/Ave | Comments |
|------------------|---------------|------------|---------|--------|--------------------|----------|
|                  |               |            | Limit   | Margin |                    |          |
| 0.685            | 29.4          | Neutral    | 46.0    | -16.6  | AVG                |          |
| 0.685            | 34.8          | Neutral    | 56.0    | -21.2  | QP                 |          |
| 1.141            | 27.7          | Neutral    | 46.0    | -18.3  | AVG                |          |
| 1.141            | 34.5          | Neutral    | 56.0    | -21.5  | QP                 |          |
| 19.502           | 30.2          | Neutral    | 50.0    | -19.8  | AVG                |          |
| 19.502           | 31.3          | Neutral    | 60.0    | -28.7  | QP                 |          |

|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz



|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

| Frequency<br>MHz | Level<br>dB $\mu$ V | AC<br>Line | Class B |        | Detector<br>QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|----------|
|                  |                     |            | Limit   | Margin |                    |          |
| 0.173            | 48.8                | Line       | 54.8    | -6.0   | Peak               |          |
| 0.190            | 46.2                | Line       | 53.9    | -7.7   | Peak               |          |
| 0.158            | 43.8                | Line       | 55.5    | -11.7  | Peak               |          |
| 0.357            | 36.3                | Line       | 48.8    | -12.5  | Peak               |          |
| 0.164            | 42.5                | Line       | 55.3    | -12.8  | Peak               |          |
| 0.208            | 40.4                | Line       | 53.3    | -12.9  | Peak               |          |
| 0.225            | 39.3                | Line       | 52.6    | -13.3  | Peak               |          |
| 1.337            | 31.4                | Line       | 46.0    | -14.6  | Peak               |          |
| 19.502           | 33.2                | Line       | 50.0    | -16.8  | Peak               |          |
| 0.176            | 46.4                | Neutral    | 54.7    | -8.3   | Peak               |          |
| 0.192            | 44.0                | Neutral    | 53.9    | -9.9   | Peak               |          |
| 0.213            | 39.1                | Neutral    | 53.0    | -13.9  | Peak               |          |
| 0.379            | 32.8                | Neutral    | 48.3    | -15.5  | Peak               |          |
| 0.360            | 33.2                | Neutral    | 48.7    | -15.5  | Peak               |          |
| 19.501           | 34.0                | Neutral    | 50.0    | -16.0  | Peak               |          |
| 1.717            | 29.2                | Neutral    | 46.0    | -16.8  | Peak               |          |
| 0.152            | 36.9                | Neutral    | 55.9    | -19.0  | Peak               |          |

|           |                                                    |                  |                   |
|-----------|----------------------------------------------------|------------------|-------------------|
| Client:   | Summit Data Communications                         | Job Number:      | J78403            |
| Model:    | SDC-WB40 and SDC-MSD40NBT (1x1 802.11abg + BT 2.1) | T-Log Number:    | T83198            |
| Contact:  | Ron Seide                                          | Account Manager: | Christine Krebill |
| Standard: | EN 301 489-1 V1.8.1/ FCC Part 15B                  | Class:           | B                 |

## Final quasi-peak and average readings

| Frequency<br>MHz | Level<br>dB $\mu$ V | AC<br>Line | Class B |        | Detector<br>QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|----------|
|                  |                     |            | Limit   | Margin |                    |          |
| 0.173            | 14.0                | Line       | 54.8    | -40.8  | AVG                |          |
| 0.173            | 44.3                | Line       | 64.8    | -20.5  | QP                 |          |
| 0.190            | 33.5                | Line       | 54.0    | -20.5  | AVG                |          |
| 0.190            | 44.4                | Line       | 64.0    | -19.6  | QP                 |          |
| 0.158            | 12.7                | Line       | 55.6    | -42.9  | AVG                |          |
| 0.158            | 31.5                | Line       | 65.6    | -34.1  | QP                 |          |
| 0.357            | 10.7                | Line       | 48.8    | -38.1  | AVG                |          |
| 0.357            | 32.2                | Line       | 58.8    | -26.6  | QP                 |          |
| 0.164            | 14.3                | Line       | 55.3    | -41.0  | AVG                |          |
| 0.164            | 41.0                | Line       | 65.3    | -24.3  | QP                 |          |
| 0.208            | 16.0                | Line       | 53.3    | -37.3  | AVG                |          |
| 0.208            | 34.6                | Line       | 63.3    | -28.7  | QP                 |          |
| 0.225            | 11.7                | Line       | 52.6    | -40.9  | AVG                |          |
| 0.225            | 23.9                | Line       | 62.6    | -38.7  | QP                 |          |
| 1.337            | 21.3                | Line       | 46.0    | -24.7  | AVG                |          |
| 1.337            | 29.5                | Line       | 56.0    | -26.5  | QP                 |          |
| 19.502           | 29.8                | Line       | 50.0    | -20.2  | AVG                |          |
| 19.502           | 30.4                | Line       | 60.0    | -29.6  | QP                 |          |
| 0.176            | 16.4                | Neutral    | 54.7    | -38.3  | AVG                |          |
| 0.176            | 44.4                | Neutral    | 64.7    | -20.3  | QP                 |          |
| 0.192            | 27.9                | Neutral    | 53.9    | -26.0  | AVG                |          |
| 0.192            | 42.6                | Neutral    | 63.9    | -21.3  | QP                 |          |
| 0.213            | 12.2                | Neutral    | 53.1    | -40.9  | AVG                |          |
| 0.213            | 33.1                | Neutral    | 63.1    | -30.0  | QP                 |          |
| 0.379            | 23.7                | Neutral    | 48.3    | -24.6  | AVG                |          |
| 0.379            | 30.7                | Neutral    | 58.3    | -27.6  | QP                 |          |
| 0.360            | 17.3                | Neutral    | 48.7    | -31.4  | AVG                |          |
| 0.360            | 29.3                | Neutral    | 58.7    | -29.4  | QP                 |          |
| 19.501           | 31.9                | Neutral    | 50.0    | -18.1  | AVG                |          |
| 19.501           | 32.6                | Neutral    | 60.0    | -27.4  | QP                 |          |
| 1.717            | 10.7                | Neutral    | 46.0    | -35.3  | AVG                |          |
| 1.717            | 18.8                | Neutral    | 56.0    | -37.2  | QP                 |          |
| 0.152            | 11.4                | Neutral    | 55.9    | -44.5  | AVG                |          |
| 0.152            | 30.6                | Neutral    | 65.9    | -35.3  | QP                 |          |

*End of Report*

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