# Electromagnetic Compatibility Test Report

## Tests Performed on a Herman Miller, Incorporated

## Transceiver Module for Wireless Sensor Communication
## Model 1B5XR5

## Radiometrics Document RP-6643B

ACCREDITED
TESTING CERT #1495.01

| |
|---|
| *Product Detail:*<br>FCC ID: XWM-HMIRADIO<br>IC: 6108A-HMIRADIO<br>Equipment type: 900 MHz Transceiver |
| *Test Standards:*<br>US CFR Title 47, Chapter I, FCC Part 15 Subpart C<br>FCC Part 15 CFR Title 47: 2008<br>Industry Canada RSS-210, Issue 7: 2007 as required for Category I Equipment<br><br>This report concerns: Original Grant for Certification<br>FCC Part 15.249 |

| *Tests Performed For:* | *Test Facility:* |
|---|---|
| **Herman Miller, Incorporated**<br>855 East Main Av., P.O. Box 302<br>Zeeland, MI 49464-0302 | **Radiometrics Midwest Corporation**<br>12 East Devonwood<br>Romeoville, IL 60446 |

| *Test Date(s): (Month-Day-Year)* |
|---|
| September 9 thru December 4, 2009 |

Document RP-6643B Revisions:

| Rev. | Issue Date | Affected Pages | Revised By |
|---|---|---|---|
| 0 | February 5, 2010 | | |
| 1 | February 9, 2010 | 7-19 | Joseph Strzelecki |
| | | | |

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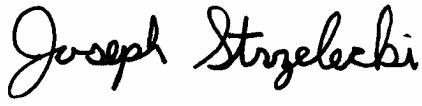
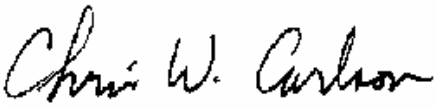
## 1 ADMINISTRATIVE DATA

| | |
|---|---|
| *Equipment Under Test:*<br>A Herman Miller, Incorporated, Base Transceiver Module<br>Model: 1B5XR5 Serial Number: None<br>This will be referred to as the EUT in this Report | |
| *Date EUT Received at Radiometrics: (Month-Day-Year)*<br>September 9, 2009 | *Test Date(s): (Month-Day-Year)*<br>September 9 thru December 4, 2009 |
| *Test Report Written By:*<br>Joseph Strzelecki<br>Senior EMC Engineer | *Test Witnessed By:*<br>The tests were not witnessed by Herman Miller, Incorporated |
| *Radiometrics' Personnel Responsible for Test:*<br>  02/09/2010<br>Joseph Strzelecki<br>Senior EMC Engineer<br>NARTE EMC-000877-NE | *Test Report Approved By*<br>  <br>Chris W. Carlson<br>Director of Engineering<br>NARTE EMC-000921-NE |

## 2 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is a Base Transceiver Module, Model 1B5XR5, manufactured by Herman Miller, Incorporated. The detailed test results are presented in a separate section. The following is a summary of the test results.

**Emissions Tests Results**

| Environmental Phenomena | Frequency Range | FCC Section | RSS-210 Section | Test Result |
|---|---|---|---|---|
| 20 dB Bandwidth Test | 902-928 MHz | 15.249 | A2.9 | Pass |
| Radiated Emissions | 30 MHz to 25 GHz | 15.249 | A2.9 | Pass |
| AC Conducted Emissions Test | 0.15-30 MHz | 15.207 | RSS-Gen-e 7.2.2 | Pass |

### 2.1 RF Exposure Compliance Requirements

Since the power output is less than 1 mW, the EUT meets the FCC requirement for RF exposure. Since the EUT is less than 200 mW, it is exempt from RSS-102. There are no power level adjustments. The detailed calculations for RF Exposure are presented in a separate document.

## 3 EQUIPMENT UNDER TEST (EUT) DETAILS

### 3.1 EUT Description

The EUT is a Base Transceiver Module for Wireless Sensor Communication, Model 1B5XR5, manufactured by Herman Miller, Incorporated. The EUT was in good working condition during the tests, with no known defects.

### 3.1.1 FCC Section 15.203 & RSS-GEN Antenna Requirements

The antenna is a half wave monopole. The antenna has a reverse polarity connector type that is not readily available to the general public. Therefore, it meets the 15.203 Requirements.

### 3.2 Related Submittals

The associated Sensor Transceiver is operated under. It is subject to the FCC requirements pursuant to the Certification equipment authorization under Part 15 Subpart C, and is being submitted as FCC ID: XWM-HMIMOTE.

The associated receiver is subject to the IC requirements pursuant to the Certification equipment authorization under RSS-210. The associated receiver is subject to the IC requirements pursuant to the Certification equipment authorization under RSS-210.

## 4 TESTED SYSTEM DETAILS

### 4.1 Tested System Configuration

The system was configured for testing in a typical fashion. The EUT was placed on an 80-cm high, nonconductive test stand. The testing was performed in conditions as close as possible to installed conditions. Wiring was consistent with manufacturer's recommendations.

Since the EUT can be wall mounted or table mounted, it was placed in an upright configuration during the tests and also Flat on a table. The EUT was tested as a stand-alone device. Power was supplied at 115 VAC, 60 Hz single-phase to its external power supply.

The identification for all equipment, plus descriptions of all cables used in the tested system, are:

**Tested System Configuration List**

| Item | Description | Type* | Manufacturer | Model Number | Serial Number |
|---|---|---|---|---|---|
| 1 | Base Transceiver for Wireless Sensor | E | Herman Miller, Incorporated | 1B5XR5 | None |
| 2 | AC/DC Adaptor 6W 9VDC | E | Not Available | DU350900300 | None |

* Type: E = EUT, P = Peripheral, S = Support Equipment; H = Host Computer

**List of System Cables**

| QTY | Length (m) | Cable Description | Connected to (Item #) | Shielded? |
|---|---|---|---|---|
| 1 | 1.8 | AC Cord | #1 Power input | No |

### 4.2 Special Accessories

No special accessories were used during the tests in order to achieve compliance.

### 4.3 Equipment Modifications

No modifications were made to the EUT at Radiometrics' test facility in order to comply with the standards listed in this report.

## 5 TEST SPECIFICATIONS AND RELATED DOCUMENTS

| Document | Date | Title |
|---|---|---|
| FCC<br>CFR Title 47 | 2008 | Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices |
| ANSI<br>C63.4-2003 | 2003 | Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| IC RSS-210<br>Issue 7 | 2007 | Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands) Category I Equipment |
| IC RSS-Gen<br>Issue 2 | 2007 | General Requirements and Information for the Certification of Radiocommunication Equipment (RSS-Gen) |

The test procedures used are in accordance with the FCC DA 00-705, <or> FCC 558074, Industry Canada RSS-212 and ANSI document C63.4-2003, "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

## 6 RADIOMETRICS' TEST FACILITIES

The results of these tests were obtained at Radiometrics Midwest Corp. in Romeoville, Illinois, USA. Radiometrics is accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025: 2005 "General Requirements for the Competence of Calibration and Testing Laboratories". Radiometrics' Lab Code is 121191 and Certification Number is 1495.01. Radiometrics' scope of accreditation includes all of the test methods listed herein. A copy of the accreditation can be accessed on our web site (www.radiomet.com). Radiometrics accreditation status can be verified at A2LA's web site (www.a2la2.org).

The following is a list of shielded enclosures located in Romeoville, Illinois used during the tests:

Chamber A: Is an anechoic chamber that measures 24' L X 12' W X 12' H. The walls and ceiling are fully lined with ferrite absorber tiles. The floor has a 10' x 10' section of ferrite absorber tiles located in the center. Panashield of Rowayton, Connecticut manufactured the chamber. The enclosure is NAMAS certified.

Chamber E: Is a custom made anechoic chamber that measures 52' L X 30' W X 18' H. The walls and ceiling are fully lined with RF absorber. Pro-shield of Collinsville, Oklahoma manufactured the chamber.

Test Station F: Is an area that measures 10' D X 12' W X 10' H. The floor and back wall are metal shielded. This area is used for conducted emissions measurements.

A separate ten-foot long, brass plated, steel ground rod attached via a 6 inch copper braid grounds each of the above chambers. Each enclosure is also equipped with low-pass power line filters.

The FCC has accepted these sites as test site number US1065. The FCC test site Registration Number is 732175. Details of the site characteristics are on file with the Industry Canada as site number IC3124A-1.

A complete list of the test equipment is provided herein. The calibration due dates are indicated on the equipment list. The equipment is calibrated in accordance to ANSI/NCSL Z540-1 with traceability to the National Institute of Standards and Technology (NIST).

## 7 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS

There were no deviations or exclusions from the test specifications.

## 8 CERTIFICATION

Radiometrics Midwest Corporation certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specification. The results relate only to the EUT listed herein. Any modifications made to the EUT subsequent to the indicated test date will invalidate the data and void this certification.

## 9 TEST EQUIPMENT TABLE

| RMC ID | Manufacturer | Description | Model No. | Serial No. | Frequency Range | Cal Period | Cal Date |
|---|---|---|---|---|---|---|---|
| AMP-05 | RMC/Celeritek | Pre-amplifier | MW110G | 1001 | 1.0-12GHz | 12 Mo. | 02/01/09 |
| AMP-22 | Anritsu | Pre-amplifier | MH648A | M23969 | 0.1-1200MHz | 12 Mo. | 02/03/09 |
| ANT-13 | EMCO | Horn Antenna | 3115 | 2502 | 1.0-18GHz | 24 Mo. | 10/22/08 |
| ANT-44 | Impossible Machine | Super Log Antenna | SL-20M2G | 1002 | 20-2000MHz | 24 Mo. | 11/25/09 |
| ANT-53 | EMCO | Loop Antenna | 6507 | 1453 | 1 kHz-30 MHz | 12 Mo | 11/04/09 |
| HPF-01 | Solar | High Pass Filter | 7930-100 | HPF-1 | 0.15-30MHz | 24 Mo. | 10/27/09 |
| LSN-01 | Electrometrics | 50 uH LISN | FCC/VDE 50/2 | 1001 | 0.01-30MHz | 24 Mo. | 06/01/09 |
| REC-01 | Hewlett Packard | Spectrum Analyzer | 8566A | 2106A02115, 2209A01349 | 30Hz-22GHz | 24 Mo. | 10/23/08 |
| REC-03 | Anritsu | Spectrum Analyzer | MS2601B | MT94589 | 0.01-2200MHz | 12 Mo. | 03/09/09 |
| REC-07 | Anritsu | Spectrum Analyzer | MS2601A | MT53067 | 0.01-2200MHz | 12 Mo. | 03/09/09 |
| THM-01 | Extech Inst. | Temp/Humid Meter | 4465CF | 001106557 | N/A | 24 Mo. | 01/18/08 |

Note: All calibrated equipment is subject to periodic checks.

## 10 TEST SECTIONS

### 10.1 AC Conducted Emissions

The tests and limits are in accordance with FCC section 15.207 and RSS Gen section 7.2.2.

A computer-controlled analyzer was used to perform the conducted emissions measurements. The frequency range was divided into 500 subranges equally spaced on a logarithmic scale. The computer recorded the peak of each subrange. This data was then plotted on semi-log graph paper generated by the computer and plotter. Adjusting the positions of the cables and orientation of the test system then maximizes the highest emissions.

Mains Conducted emission measurements were performed using a 50 Ohm/50 uH Line Impedance Stabilization Network (LISN) as the pick-up device. Measurements were repeated on both leads within the power cord. If the EUT power cord exceeded 80 cm in length, the excess length of the power cord was made into a 30 to 40 cm bundle near the center of the cord. The LISN was placed on the floor at the base of the test platform and electrically bonded to the ground plane.

Broadband conducted emissions may exceed the following limits by no more than 13 dB. An emission is defined as broadband if the average detector amplitude is 6 dB or more under the quasi-peak detector amplitude.

**FCC Limits of Conducted Emissions at the AC Mains Ports**

| Frequency Range (MHz) | Class B Limits (dBuV) | |
|---|---|---|
| | Quasi-Peak | Average |
| 0.150 - 0.50* | 66 - 56 | 56 - 46 |
| 0.5 – 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |
| * The limit decreases linearly with the logarithm of the frequency in this range. | | |

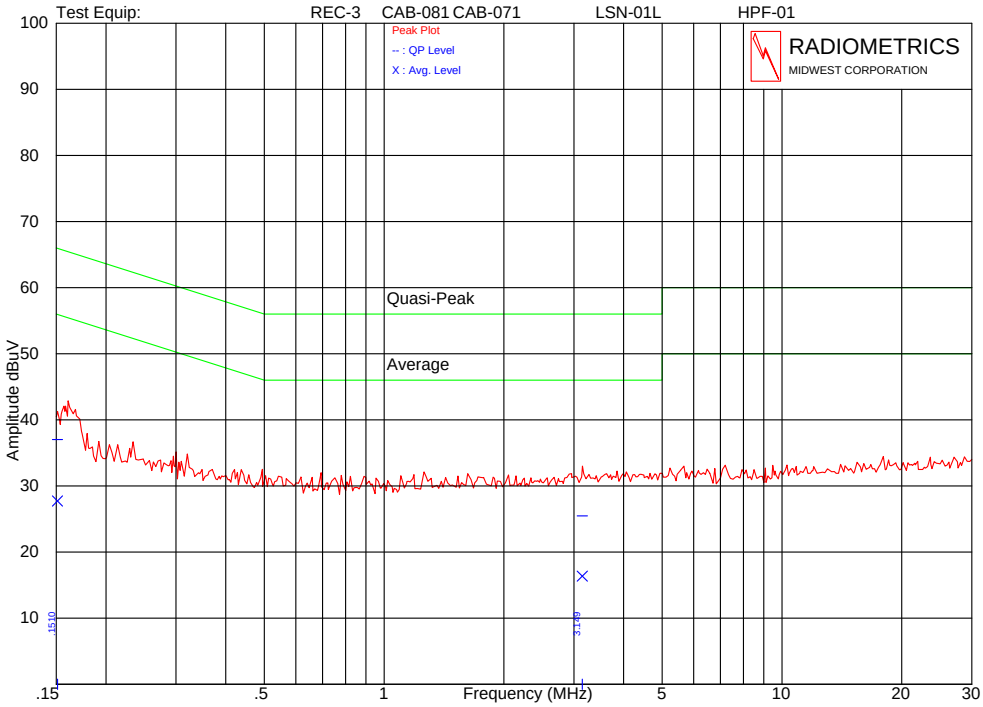
The initial step in collecting conducted data is a peak detector scan and the plotting of the measurement range. Significant peaks are then marked as shown on the following table, and these signals are then measured with the quasi-peak detector. The following represents the worst case emissions from the host computer (with the EUT connected) power cord, after testing all modes of operation.

Test Date : December 4, 2009
The Amplitude is the final corrected value with cable and LISN Loss.

| Lead Tested | Frequency MHz | QP Amplitude | QP Limit | Average Amplitude | Average Limit |
|---|---|---|---|---|---|
| AC Neutral | 3.072 | 25.6 | 56.0 | 16.4 | 46.0 |
| AC Hot | 0.151 | 37.0 | 65.9 | 27.7 | 55.9 |
| AC Hot | 3.150 | 25.5 | 56.0 | 16.4 | 46.0 |

The above are the worst case results with three frequencies test for each EUT
* QP readings are quasi-peak with a 9 kHz bandwidth and no video filter.

Judgment: Passed by at least 10 dB



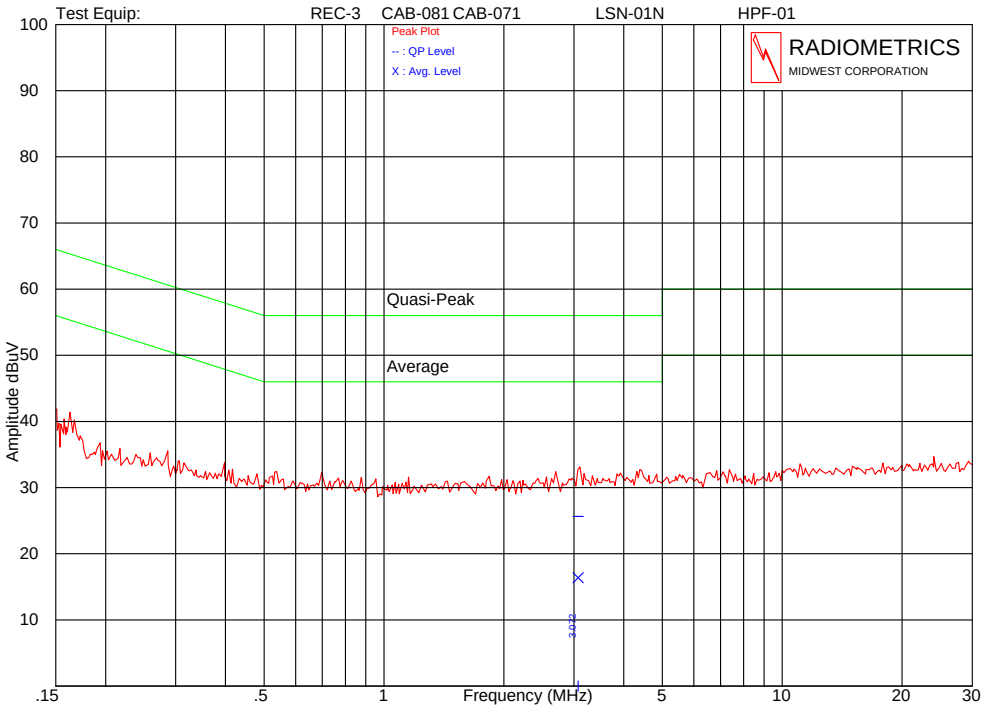

Company: Herman Miller
Lead Tested: AC Hot 120 VAC
Notes: Tx thru all 4 channels

Model: 1B5XR5
S/N : NONE

Date :12-04-2009
Time:10:25
Tested By: RWG/JRS

FCC 15 & EN55022 Class B Conducted Emission Test; Mains Port Disturbances.

RP-6643 | L1C4



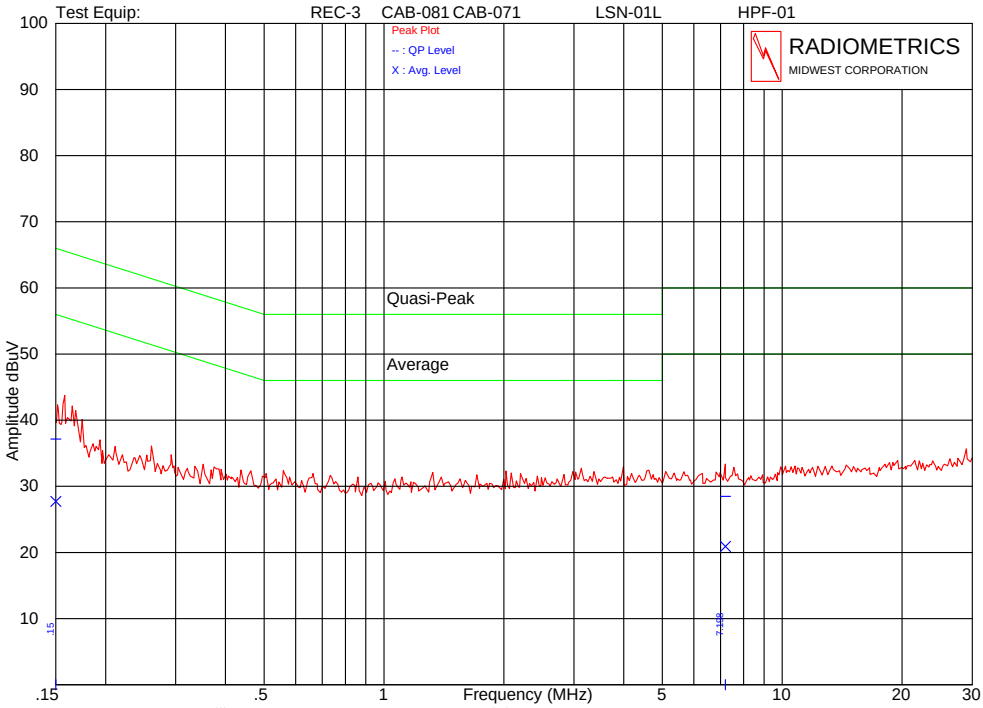

Company: Herman Miller
Lead Tested: AC Neutral 120 VAC
Notes: Tx thru all 4 channels

Model: 1B5XR5
S/N : NONE

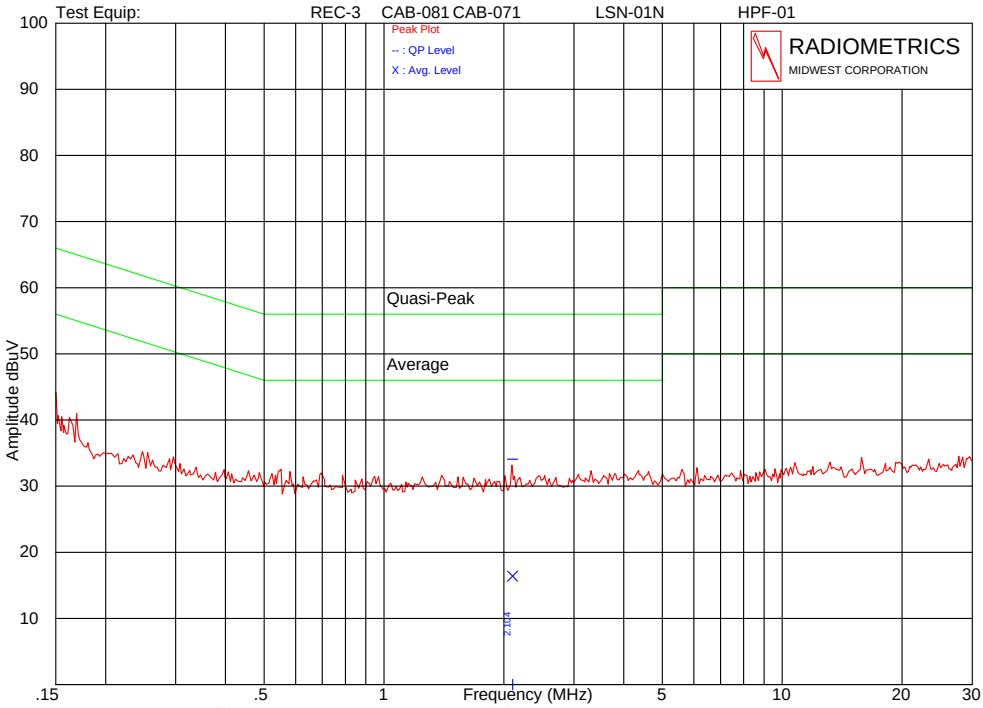
Date :12-04-2009
Time:10:31
Tested By: RWG/JRS

FCC 15 & EN55022 Class B Conducted Emission Test; Mains Port Disturbances.

RP-6643 | L2C4

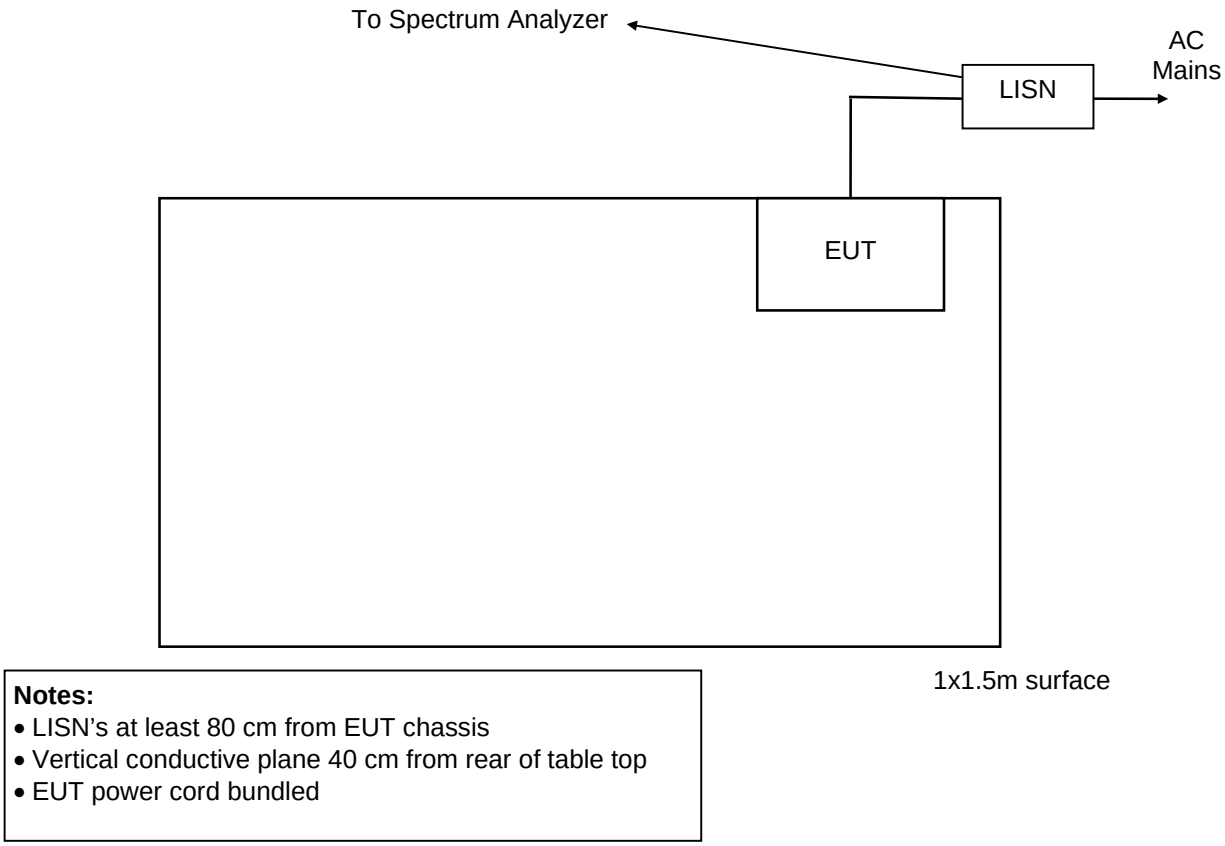



Company: Herman Miller
Lead Tested: AC Hot 120 VAC
Notes: Rx mode enabled
Model: 1B5XR5
S/N : NONE
Date :12-04-2009
Time:11:03
Tested By: rwg/jrs
FCC 15 & EN55022 Class B Conducted Emission Test; Mains Port Disturbances.
RP-6643 | L1RX




Company: Herman Miller
Lead Tested: AC Neutral 120 VAC
Notes: Rx mode enabled
Model: 1B5XR5
S/N : NONE
Date :12-04-2009
Time:10:56
Tested By: rwg/jrs
FCC 15 & EN55022 Class B Conducted Emission Test; Mains Port Disturbances.
RP-6643 | L2RX

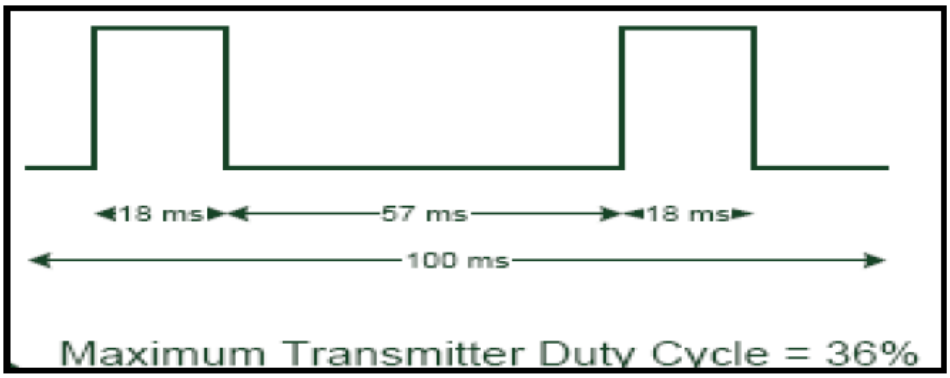
**Figure 1. Conducted Emissions Test Setup**




## 10.2 Time of Occupancy (Dwell Time)

The maximum On-Time for any 100mSec period is 36 mSeconds. Therefore, the peak to average factor is 20*Log(36/100) = -8.9 dB

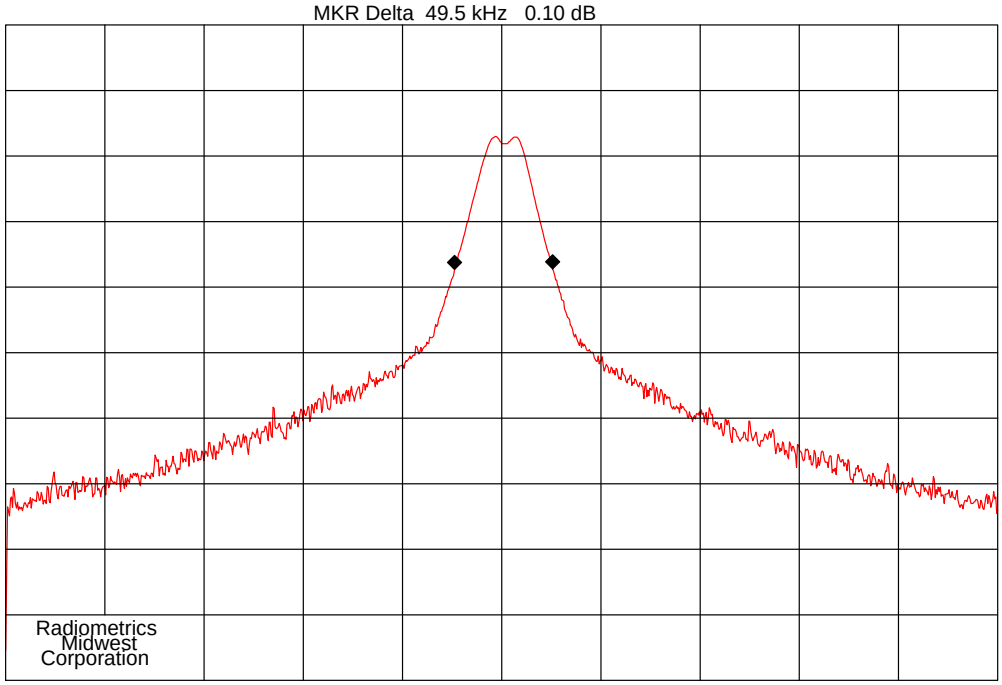
**Figure 2. Duty cycle plots**




## 10.3 Occupied Bandwidth (20 dB)

The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

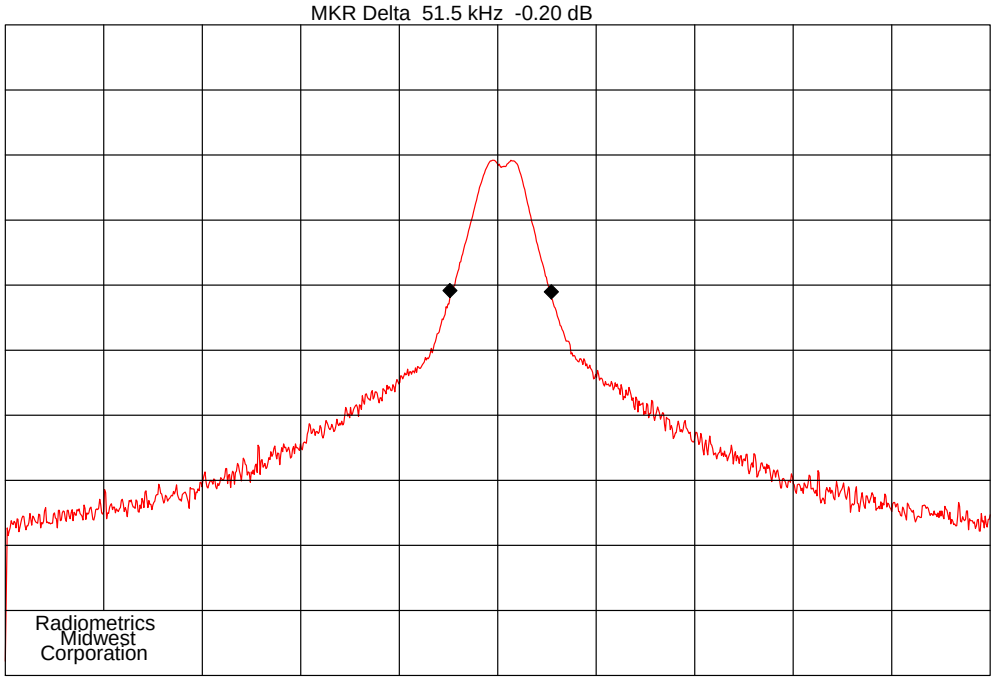
The marker-to-peak function was set to the peak of the emission. Then the marker-delta function was used to measure 20 dB down one side of the emission. The marker-delta function was reset and then moved to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.




Company: Herman Miller
CENTER 903.000 MHz
RES BW 10 kHz
10 dB/
Notes: Occupied Bandwidth, 903 MHz

ITEM : Base Module
REF -10.0 dBm
VBW 30 kHz
Time: 15:38

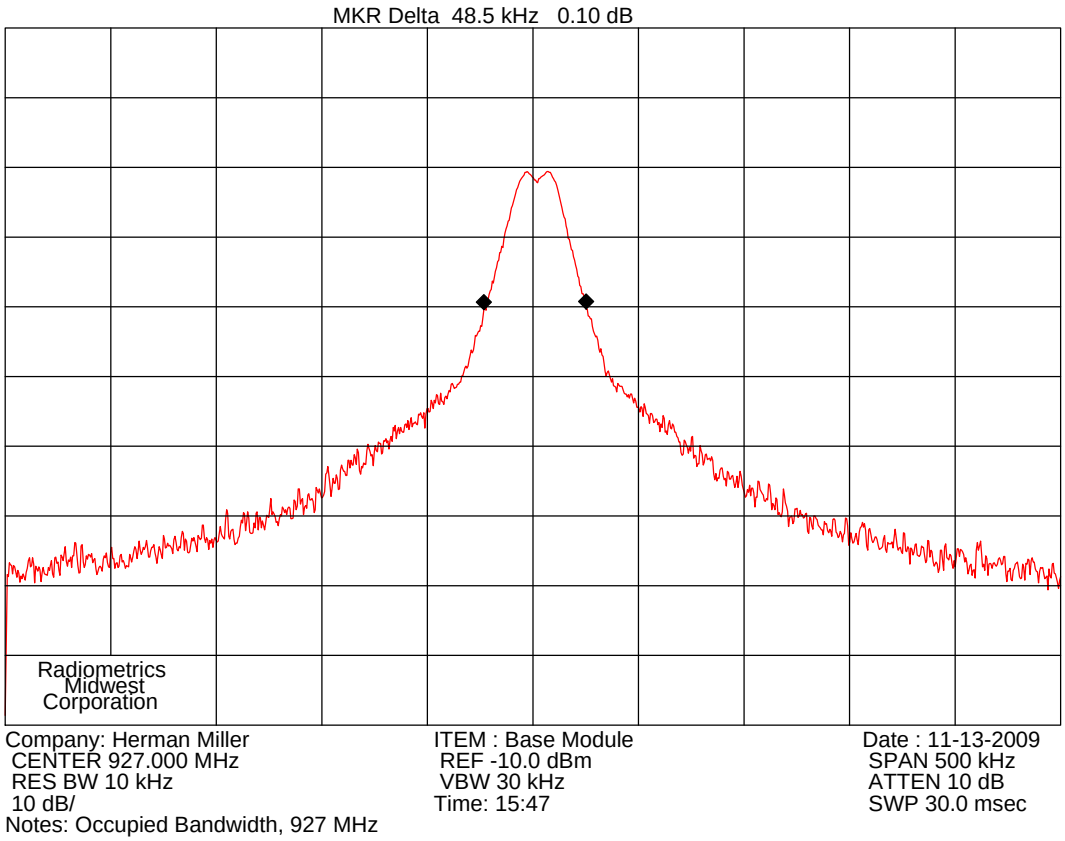
Date : 11-13-2009
SPAN 500 kHz
ATTEN 10 dB
SWP 30.0 msec




Company: Herman Miller
CENTER 919.000 MHz
RES BW 10 kHz
10 dB/
Notes: Occupied Bandwidth, 919 MHz

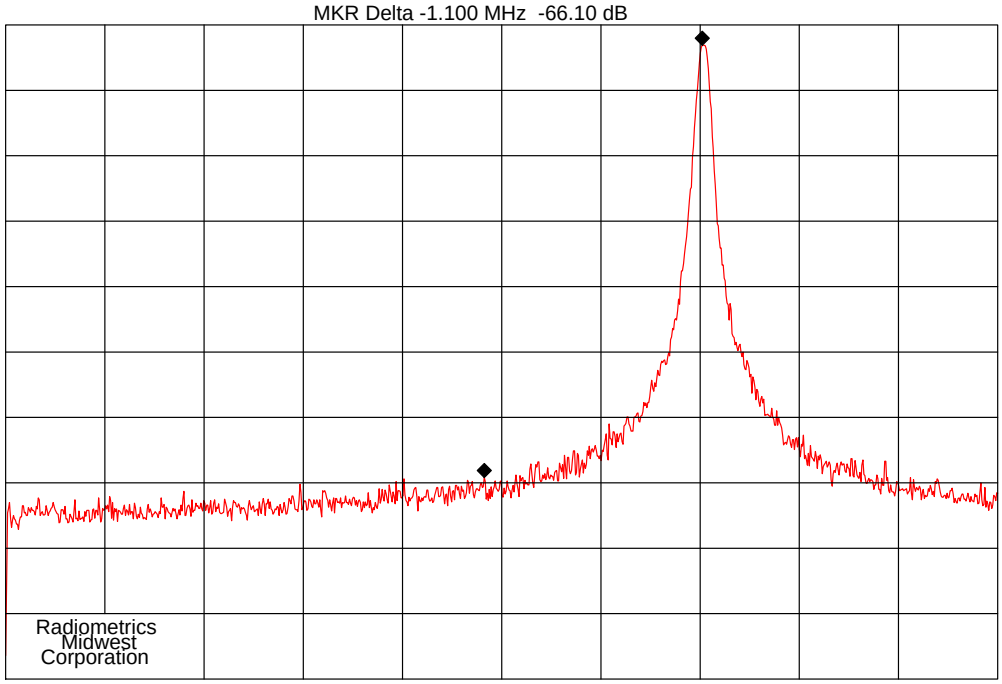
ITEM : Base Module
REF -10.0 dBm
VBW 30 kHz
Time: 15:45

Date : 11-13-2009
SPAN 500 kHz
ATTEN 10 dB
SWP 30.0 msec




## 10.4 Band-edge Compliance of RF Emissions

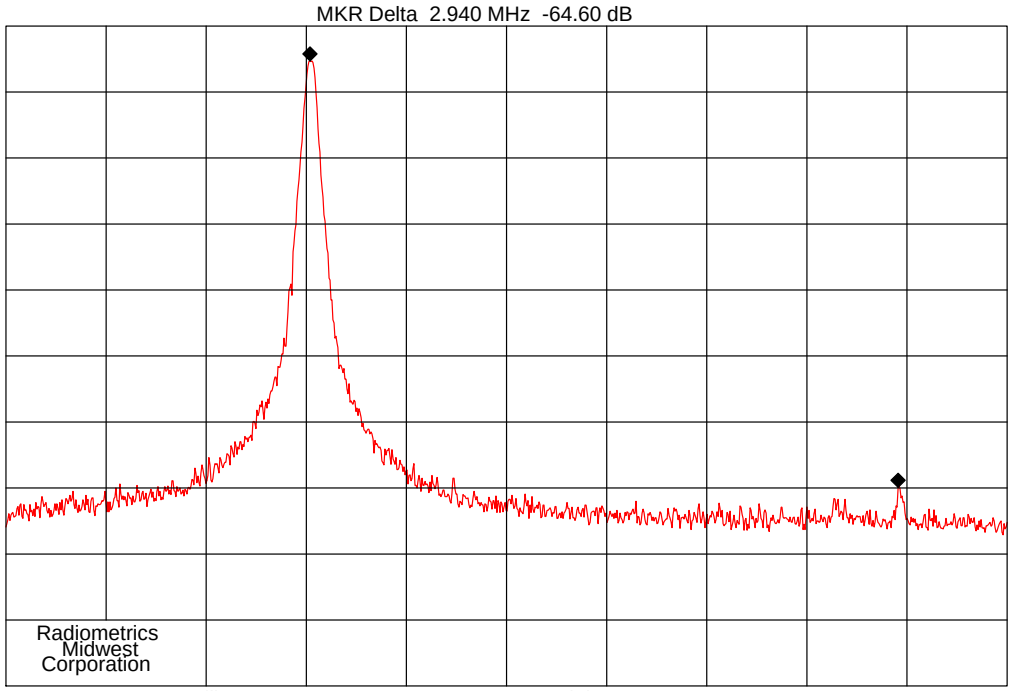
The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation at the band-edge, with the EUT set to the lowest frequency. The trace was allowed to stabilize.




Company: Herman Miller
CENTER 902.00 MHz
RES BW 30 kHz
10 dB/
Notes: Band Edge, 903 MHz

ITEM : Base Module
REF -20.0 dBm
VBW 100 kHz
Time: 16:00

Date : 11-13-2009
SPAN 5.00 MHz
ATTEN 0 dB
SWP 20.0 msec




Company: Herman Miller
CENTER 928.00 MHz
RES BW 30 kHz
10 dB/
Notes: Band Edge, 927 MHz

ITEM : Base Module
REF -20.0 dBm
VBW 100 kHz
Time: 16:03

Date : 11-13-2009
SPAN 5.00 MHz
ATTEN 0 dB
SWP 20.0 msec

## 10.5 Radiated Emissions

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. The radiated emission measurements were performed with a spectrum analyzer. The bandwidth used from 150 kHz to 30 MHz is 9 or 10 kHz and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. Above 1 GHz, a 1 MHz bandwidth is used. A 10 dB linearity check is performed prior to start of testing in order to determine if an overload condition exists.

From 30 to 1000 MHz, an Anritsu spectrum analyzer was used. For tests from 1 to 25 GHz, an HP 8566 spectrum analyzer was used. For tests from 1 to 10 GHz, a high pass filter was used to reduce the fundamental emission. A harmonic mixer was used from 18 to 25 GHz. Figure 4 herein lists the details of the test equipment used during radiated emissions tests.

In addition, a high pass filter was used to reduce the fundamental emission. The was device was rotated through three orthogonal axis as per 13.1.4.1 of ANSI C63.4 during the prescans and during final radiated tests.

Final radiated emissions measurements were performed inside of an anechoic chamber at a test distance of 3 meters. The anechoic chamber is designated as Chamber E. This Chamber meets the Site Attenuation requirements of ANSI C63.4 and CISPR 16-1. Chamber E is located at 12 East Devonwood Ave. Romeoville, Illinois EMI test lab.

The entire frequency range from 30 to 9300 MHz was slowly scanned with particular attention paid to those frequency ranges which appeared high. Measurements were performed using two antenna polarizations, (vertical and horizontal). The worst case emissions were recorded. All measurements may be performed using either the peak, average or quasi-peak detector functions. If the peak detector data exceeds or is marginally close to the limits, the measurements are repeated using a quasi-peak detector or average function as required by the specification for final determination of compliance.

The detected emission levels were maximized by rotating the EUT, adjusting the positions of all cables, and by scanning the measurement antenna from 1 to 4 meters above the ground.

### 10.5.1 Radiated Emissions Field Strength Sample Calculation

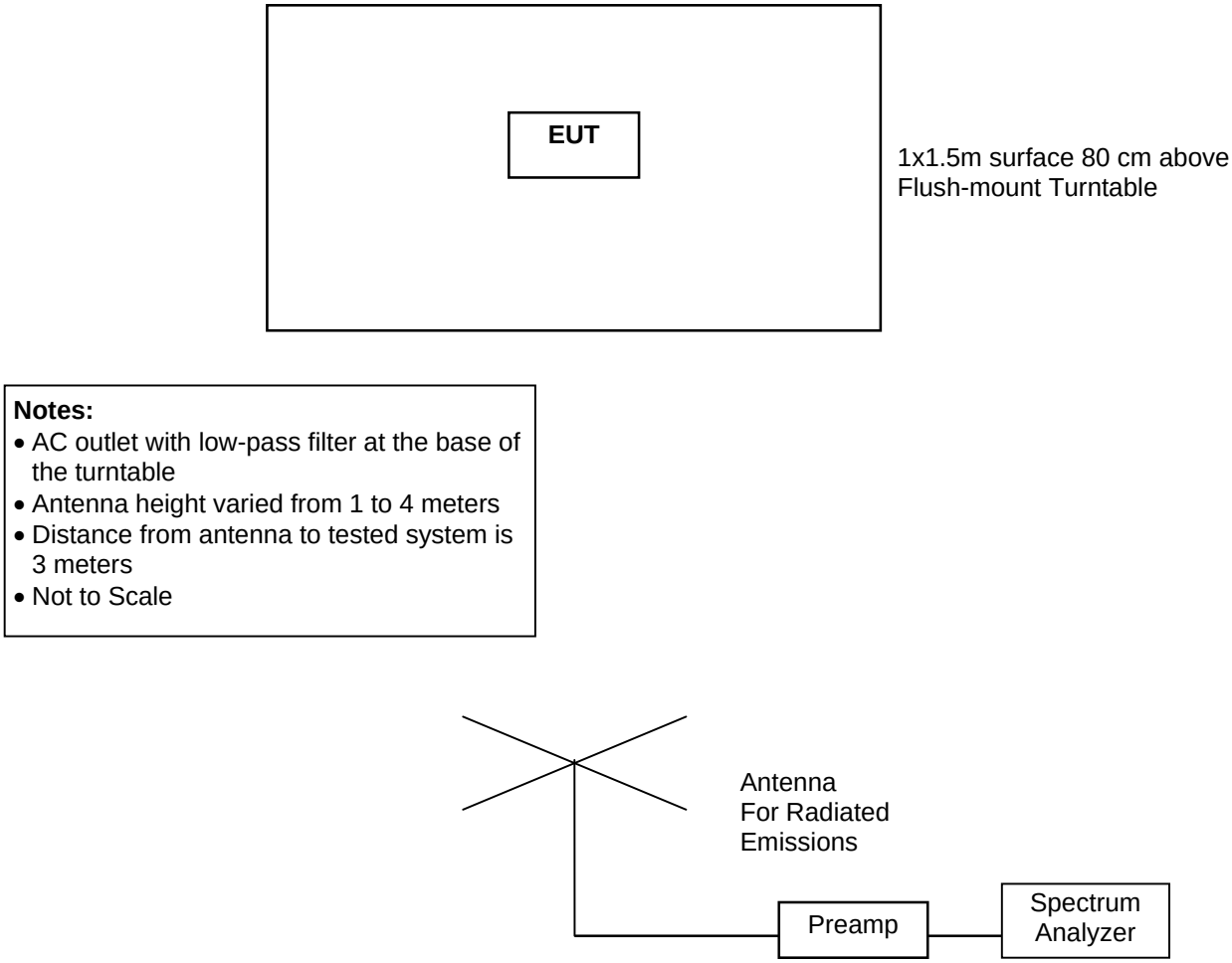
The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation is as follows:

FS = RA + AF + CF - AG

Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain
HPF = High pass Filter Loss
PKA = Peak to Average Factor (This is zero for non-average measurements)

The Peak to average factor is used when average measurements are required. It is calculated by the highest duty cycle in percent over any 100mS transmission. The factor in dB is 20 * Log(Duty cycle/100).

**Figure 3. Drawing of Radiated Emissions Setup**




### 10.5.2 Radiated Emissions Test Results

The following spectrum analyzer settings were used.

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW;  Sweep = auto
A Video Bandwidth of 10 Hz was used for Average measurements above 1 GHz.

**Transmitter emissions and Emissions above 1 GHz**

| | | Spectrum Analyzer Readings | | | | | | | EUT | Peak | Ave | Peak | Ave | Margin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| hrm | Tx | Peak | | Ave | Peak | | Ave | Corr. | Emission | Tot. FS | | Limit | | Under |
| | | Vertical Polarization | | | Horizontal Polarization | | | | Freq | | | | | |
| # | Freq | X | Y | Max | X | Y | Max | Fact. | MHz | dBuV/m | | dBuV/m | | Limit |
| 1 | 903 | 67.6 | 55.8 | 58.7 | 58.7 | 57.0 | 49.8 | 25.0 | 903 | 92.6 | 83.7 | 94 | 94 | 1.4 |
| 2 | 903 | 37.0 | 32.6 | 28.1 | 38.7 | 43.3 | 34.4 | 1.8 | 1806 | 45.1 | 36.2 | 74 | 54 | 17.8 |
| 3 | 903 | 39.5 | 38.7 | 30.6 | 36.4 | 40.5 | 31.6 | 4.9 | 2709 | 45.4 | 36.5 | 74 | 54 | 17.5 |
| 4 | 903 | 35.9 | 35.8 | 27.0 | 32.3 | 36.9 | 28.0 | 9.0 | 3612 | 45.9 | 37.0 | 74 | 54 | 17.0 |
| 5 | 903 | 41.5 | 42.9 | 34.0 | 35.4 | 41.9 | 33.0 | 11.5 | 4515 | 54.4 | 45.5 | 74 | 54 | 8.5 |
| 6 | 903 | 37.6 | 37.0 | 28.7 | 36.0 | 40.5 | 31.6 | 12.9 | 5418 | 53.4 | 44.5 | 74 | 54 | 9.5 |
| 7 | 903 | 37.2 | 35.3 | 28.3 | 33.2 | 39.1 | 30.2 | 14.0 | 6321 | 53.1 | 44.2 | 74 | 54 | 9.8 |
| 1 | 919 | 68.0 | 57.0 | 59.1 | 60.0 | 56.8 | 51.1 | 25.0 | 919 | 93.0 | 84.1 | 94 | 94 | 1.0 |
| 2 | 919 | 39.5 | 36.5 | 30.6 | 40.0 | 44.2 | 35.3 | 2.0 | 1838 | 46.2 | 37.3 | 74 | 54 | 16.7 |
| 3 | 919 | 43.0 | 41.0 | 34.1 | 38.9 | 47.2 | 38.3 | 5.0 | 2757 | 52.2 | 43.3 | 74 | 54 | 10.7 |
| 4 | 919 | 36.4 | 36.9 | 28.0 | 32.5 | 39.7 | 30.8 | 9.3 | 3676 | 49.0 | 40.1 | 74 | 54 | 13.9 |
| 5 | 919 | 48.4 | 38.8 | 39.5 | 38.5 | 39.7 | 30.8 | 11.7 | 4595 | 60.1 | 51.2 | 74 | 54 | 2.8 |
| 6 | 919 | 42.5 | 42.4 | 33.6 | 38.2 | 40.4 | 31.5 | 13.2 | 5514 | 55.7 | 46.8 | 74 | 54 | 7.2 |
| 7 | 919 | 42.4 | 39.6 | 33.5 | 36.1 | 39.5 | 30.6 | 13.7 | 6433 | 56.1 | 47.2 | 74 | 54 | 6.8 |
| 1 | 927 | 67.8 | 56.8 | 58.9 | 60.3 | 59.5 | 51.4 | 25.0 | 927 | 92.8 | 83.9 | 94 | 94 | 1.2 |
| 2 | 927 | 40.9 | 37.5 | 32.0 | 43.7 | 46.2 | 37.3 | 2.1 | 1854 | 48.3 | 39.4 | 74 | 54 | 14.6 |
| 3 | 927 | 43.1 | 41.1 | 34.2 | 39.3 | 48.2 | 39.3 | 5.0 | 2781 | 53.2 | 44.3 | 74 | 54 | 9.7 |
| 4 | 927 | 34.3 | 36.7 | 27.8 | 31.2 | 31.5 | 22.6 | 9.4 | 3708 | 46.1 | 37.2 | 74 | 54 | 16.8 |
| 5 | 927 | 45.4 | 42.5 | 36.5 | 39.5 | 47.0 | 38.1 | 11.7 | 4635 | 58.7 | 49.8 | 74 | 54 | 4.2 |
| 6 | 927 | 42.6 | 44.1 | 35.2 | 38.5 | 43.1 | 34.2 | 13.2 | 5562 | 57.3 | 48.4 | 74 | 54 | 5.6 |
| 7 | 927 | 40.1 | 39.4 | 31.2 | 34.6 | 36.2 | 27.3 | 13.8 | 6489 | 53.9 | 45.0 | 74 | 54 | 9.0 |
| Column numbers (see below for explanations) | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

Judgment: Passed by 1.0 dB
No other emissions were detected from 900 MHz to 10 GHz. No Band edge emissions detected.

Column #1. hrm = Harmonic; BE = Band Edge emissions
Column #2. Frequency of Transmitter.
Column #3. Uncorrected readings from the spectrum analyzer with EUT upright as in Wall Mounted.
Column #4. Uncorrected readings from the spectrum analyzer with EUT Flat as in Table Mounted.
Column #5. Average Reading based on peak reading reduced by the Duty cylce correction. This is based on the highest of the Two readings
Column #6. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #7. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #8. Average Reading based on peak reading reduced by the Duty cylce correction. This is based on the highest of the Two readings
Column #9. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor
Column #10. Frequency of Tested Emission
Column #11. Highest peak field strength at listed frequency.
Column #12. Highest Average field strength at listed frequency.
Column #13. Peak Limit.
Column #14. Average Limit.
Column #15. The margin (last column) is the worst case margin under the peak or average limits for that row.

Spurious Emissions Below 1 GHz
Transmit Mode

| Freq. MHz | Meter Reading dBuV | Dect. Type | Antenna Factor dB | Antenna Pol/ ID# | Corr. Factors dB | Field Strength dBuV/m EUT | Field Strength dBuV/m Limit | Margin Under Limit dB |
|---|---|---|---|---|---|---|---|---|
| 54.0 | 30.6 | P | 13.8 | H/44 | -27.5 | 16.9 | 40.0 | 23.1 |
| 67.6 | 30.8 | P | 8.1 | H/44 | -27.3 | 11.6 | 40.0 | 28.4 |
| 79.6 | 32.0 | P | 7.2 | H/44 | -27.1 | 12.0 | 40.0 | 28.0 |
| 96.0 | 32.0 | P | 8.9 | H/44 | -26.9 | 14.0 | 43.5 | 29.5 |
| 162.8 | 35.0 | P | 10.4 | H/44 | -26.3 | 19.1 | 43.5 | 24.4 |
| 200.8 | 33.6 | P | 10.3 | H/44 | -26.0 | 17.8 | 43.5 | 25.7 |
| 227.2 | 32.5 | P | 11.8 | H/44 | -25.9 | 18.4 | 46.0 | 27.6 |
| 296.2 | 33.5 | P | 13.7 | H/44 | -25.5 | 21.7 | 46.0 | 24.3 |
| 315.2 | 31.6 | P | 14.1 | H/44 | -25.4 | 20.4 | 46.0 | 25.6 |
| 412.1 | 29.9 | P | 16.3 | H/44 | -24.7 | 21.5 | 46.0 | 24.5 |
| 538.0 | 29.4 | P | 18.2 | H/44 | -24.2 | 23.4 | 46.0 | 22.6 |
| 786.0 | 29.0 | P | 21.4 | H/44 | -22.2 | 28.2 | 46.0 | 17.8 |
| 48.4 | 39.4 | P | 13.6 | V/44 | -27.6 | 25.4 | 40.0 | 14.6 |
| 95.2 | 39.5 | P | 9.9 | V/44 | -26.9 | 22.4 | 43.5 | 21.1 |
| 114.4 | 34.2 | P | 14.3 | V/44 | -26.8 | 21.7 | 43.5 | 21.8 |
| 133.2 | 33.8 | P | 13.9 | V/44 | -26.6 | 21.1 | 43.5 | 22.4 |
| 158.8 | 37.5 | P | 11.1 | V/44 | -26.4 | 22.2 | 43.5 | 21.3 |
| 199.6 | 37.6 | P | 10.1 | V/44 | -26.0 | 21.7 | 43.5 | 21.8 |
| 218.4 | 34.8 | P | 11.5 | V/44 | -25.9 | 20.3 | 46.0 | 25.7 |
| 229.0 | 33.5 | P | 11.6 | V/44 | -25.9 | 19.2 | 46.0 | 26.8 |
| 283.3 | 43.1 | P | 12.7 | V/44 | -25.6 | 30.2 | 46.0 | 15.8 |
| 393.6 | 30.5 | P | 15.5 | V/44 | -25.0 | 21.1 | 46.0 | 24.9 |
| 439.0 | 29.9 | P | 16.0 | V/44 | -24.7 | 21.2 | 46.0 | 24.8 |
| 529.0 | 29.7 | P | 17.4 | V/44 | -24.2 | 22.8 | 46.0 | 23.2 |
| 724.0 | 28.7 | P | 20.0 | V/44 | -22.9 | 25.8 | 46.0 | 20.2 |
| 870.0 | 31.9 | P | 21.1 | V/44 | -21.4 | 31.6 | 46.0 | 14.4 |

### 10.5.3 Receive Mode Radiated Emissions

| | | | |
|---|---|---|---|
| Manufacturer | Herman Miller, Incorporated | Specification | FCC Part 15 Subpart C & RSS-210 |
| Model | 1B5XR5 | Test Date | 11/11/2009 |
| Serial Number | None | Test Distance | 3 Meters |
| Abbreviations | Pol = Antenna Polarization; V = Vertical; H = Horizontal; BC = Biconical (ANT-3); LP = Log-Periodic (ANT-6); HN = Horn (ANT-13) P = peak; Q = QP | | |
| Notes | Corr. Factors = Cable Loss – Preamp Gain | | |

| Freq. MHz | Meter Reading dBuV | Dect. Type | Antenna Factor dB | Antenna Pol/ ID# | Corr. Factors dB | Field Strength dBuV/m EUT | Field Strength dBuV/m Limit | Margin Under Limit dB |
|---|---|---|---|---|---|---|---|---|
| 34.4 | 31.3 | P | 17.5 | H/44 | -27.8 | 21.0 | 40.0 | 19.0 |
| 140.0 | 30.9 | P | 11.9 | H/44 | -26.5 | 16.3 | 43.5 | 27.2 |
| 162.4 | 31.6 | P | 10.5 | H/44 | -26.3 | 15.8 | 43.5 | 27.7 |
| 201.6 | 37.1 | P | 10.3 | H/44 | -26.0 | 21.4 | 43.5 | 22.1 |
| 239.6 | 29.1 | P | 12.4 | H/44 | -25.7 | 15.8 | 46.0 | 30.2 |
| 296.2 | 33.6 | P | 13.7 | H/44 | -25.5 | 21.8 | 46.0 | 24.2 |
| 454.6 | 29.2 | P | 17.1 | H/44 | -24.7 | 21.6 | 46.0 | 24.4 |
| 576.0 | 28.0 | P | 18.8 | H/44 | -23.5 | 23.3 | 46.0 | 22.7 |
| 669.0 | 28.8 | P | 20.1 | H/44 | -23.1 | 25.8 | 46.0 | 20.2 |
| 796.0 | 28.3 | P | 21.7 | H/44 | -22.0 | 28.0 | 46.0 | 18.0 |
| 861.0 | 29.1 | P | 21.9 | H/44 | -21.5 | 29.5 | 46.0 | 16.5 |
| 937.0 | 28.9 | P | 22.7 | H/44 | -20.6 | 31.0 | 46.0 | 15.0 |
| 1166.0 | 30.6 | P | 24.1 | H/44 | -20.9 | 33.8 | 54.0 | 20.2 |
| 1207.0 | 31.2 | P | 24.1 | H/44 | -20.7 | 34.6 | 54.0 | 19.4 |
| 1408.0 | 29.8 | P | 25.3 | H/44 | -19.7 | 35.4 | 54.0 | 18.6 |
| 49.2 | 39.8 | P | 13.5 | V/44 | -27.6 | 25.7 | 40.0 | 14.3 |
| 95.6 | 36.1 | P | 10.0 | V/44 | -26.9 | 19.2 | 43.5 | 24.3 |
| 114.4 | 34.0 | P | 14.3 | V/44 | -26.7 | 21.6 | 43.5 | 21.9 |
| 133.2 | 33.4 | P | 13.9 | V/44 | -26.6 | 20.7 | 43.5 | 22.8 |
| 171.2 | 37.3 | P | 9.9 | V/44 | -26.2 | 21.0 | 43.5 | 22.5 |
| 199.6 | 40.5 | P | 10.1 | V/44 | -26.0 | 24.6 | 43.5 | 18.9 |
| 208.8 | 35.2 | P | 10.8 | V/44 | -25.9 | 20.1 | 43.5 | 23.4 |
| 229.0 | 32.8 | P | 11.6 | V/44 | -25.8 | 18.6 | 46.0 | 27.4 |
| 296.2 | 30.6 | P | 13.2 | V/44 | -25.5 | 18.3 | 46.0 | 27.7 |
| 343.8 | 28.9 | P | 14.6 | V/44 | -25.1 | 18.4 | 46.0 | 27.6 |
| 461.9 | 30.0 | P | 16.5 | V/44 | -24.6 | 21.9 | 46.0 | 24.1 |
| 530.0 | 28.8 | P | 17.4 | V/44 | -24.2 | 22.0 | 46.0 | 24.0 |
| 631.0 | 28.2 | P | 18.7 | V/44 | -23.5 | 23.4 | 46.0 | 22.6 |
| 772.0 | 28.2 | P | 20.0 | V/44 | -22.2 | 26.0 | 46.0 | 20.0 |
| 870.0 | 31.5 | P | 21.1 | V/44 | -21.4 | 31.2 | 46.0 | 14.8 |
| 924.0 | 28.8 | P | 21.7 | V/44 | -20.8 | 29.7 | 46.0 | 16.3 |