Electromagnetic Compatibility Test Report

Tests Performed on a Wearable, Inc.

WiFi module with SD card, Model A02

Radiometrics Document RP-7122

ACCREDITED
TESTING CERT #1495.01

Product Detail:
FCC ID: XSNA02
IC: 8639A-A02
Equipment type: 2.4 GHz DTS Transmitter

Test Standards:
US CFR Title 47, Chapter I, FCC Part 15 Subpart C
FCC Part 15 CFR Title 47: 2011
Industry Canada RSS-210, Issue 8: 2010 as required for Category I Equipment

This report concerns: Original Grant for Certification
FCC Part 15.247

Tests Performed For:	*Test Facility:*
Wearable, Inc. 3825 Charles Drive Northbrook, IL 60062	**Radiometrics Midwest Corporation** 12 East Devonwood Romeoville, IL 60446 (815) 293-0772

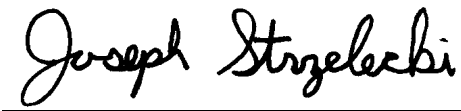
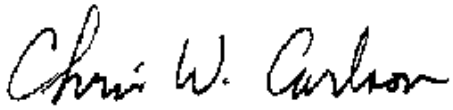
Test Date(s): (Month-Day-Year)
September 22-24, 2011

Document RP-7122 Revisions:

Rev.	Issue Date	Affected Sections	Revised By
0	October 18, 2011		
1	November 9, 2011	2 & 10.2	Joseph Strzelecki

Table of Contents

1 ADMINISTRATIVE DATA

Equipment Under Test: A Wearable Inc., WiFi module with SD card Model: A02 Serial Number: 2 This will be referred to as the EUT in this Report	
Date EUT Received at Radiometrics: (Month-Day-Year) September 21, 2011	*Test Date(s): (Month-Day-Year)* September 22-24, 2011
Test Report Written By: Joseph Strzelecki Senior EMC Engineer	*Test Witnessed By:* Matt Klapman Wearable, Inc.
Radiometrics' Personnel Responsible for Test:  Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE	*Test Report Approved By*  Chris W. Carlson Director of Engineering NARTE EMC-000921-NE

2 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is a WiFi module with SD card, Model A02, manufactured by Wearable, Inc. The detailed test results are presented in a separate section. The following is a summary of the test results.

Spread Spectrum Transmitter Requirements

Environmental Phenomena	Frequency Range	FCC Section	RSS- Section	Test Result
RF AC Mains Conducted Emissions	0.15 - 30 MHz	15.207	GEN; 7.2.2	Pass
RF Radiated Emissions	30-25,000 MHz	15.209	GEN; 7.2.5	Pass
6 dB Bandwidth Test	2400 to 2483 MHz	15.247 a	210; A8.1 (4)	Pass
Peak Output Power	2400 to 2483 MHz	15.247 b	210; A8.1 (1)	Pass
Band-edge Compliance of RF Conducted Emissions	2400 to 2483 MHz	15.247 d	210; A8.4 (2)	Pass
Spurious Radiated Emissions	30 MHz to 25 GHz	15.247 d	210; A8.5	Pass
Power Spectral Density	2400 to 2483 MHz	15.247 e	210; A8.2 (1)	Pass

Note: The RSS-210 specification is not currently covered in Radiometrics' Scope of Accreditation. This is technically very similar to FCC, CFR 47 Part 15 which is on Radiometrics scope.

2.1 RF Exposure Compliance Requirements

Since the average power output is 14 mW, the EUT meets the FCC requirement for RF exposure for handheld devices with no SAR testing required, and it is exempt from RSS-102. There are no power level adjustments and the antenna is permanently attached. 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 WiFi module with SD card, Model A02, manufactured by Wearable, Inc. 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 permanently attached to the PCB via a trace on the circuit board. The antenna is internal to the EUT and it is not readily available to be modified by the end user. Therefore, it meets the 15.203 Requirements.

3.2 Related Submittals

Wearable Inc. is not submitting any other products simultaneously for equipment authorization related to the EUT.

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.

The EUT was tested in two modes:
1. With an internal battery. For this test, the EUT was tested stand alone.
2. Charging via a USB port.

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	WiFi module with SD card	E	Wearable, Inc.	A02	Sample 1
2	USB Charger	P	Palm	157-10124-00	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	1.0	USB cable	#1 Power input	Yes

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 CFR Title 47	2011	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices
ANSI 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 Issue 8	2010	Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands) Category I Equipment
IC RSS-Gen Issue 3	2010	General Requirements and Information for the Certification of Radiocommunication Equipment (RSS-Gen)
FCC DA 00-705	2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
FCC 558074	2005	Measurement of Digital Transmission Systems Operating under Section 15.247

The test procedures used are in accordance with the FCC DA 00-705, <or> FCC 558074, Industry Canada RSS-GEN 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 and the data contained herein was taken with calibrated test equipment. The results relate only to the EUT listed herein.

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.	01/19/11
AMP-20	Avantek	Pre-amplifier	SF8-0652	15221	8-18GHz	12 Mo	01/18/11
AMP-22	Anritsu	Pre-amplifier	MH648A	M23969	0.1-1200MHz	12 Mo.	01/18/11
AMP-29	HP / Agilent	Amplifier	11975A	2304A00158	2-8 GHz	12 Mo.	04/05/11
ANT-13	EMCO	Horn Antenna	3115	2502	1.0-18GHz	24 Mo.	11/18/10
ANT-44	Impossible Machine	Super Log Antenna	SL-20M2G	1002	20-2000MHz	24 Mo.	11/25/09
ANT-48	RMC	Std Gain Horn	HW2020	1001	18-26 GHz	12 Mo.	04/05/11
ANT-53	EMCO	Loop Antenna	6507	1453	1 kHz-30 MHz	24 Mo	11/04/09
HPF-01	Solar	High Pass Filter	7930-100	HPF-1	0.15-30MHz	24 Mo.	10/27/09
HPF-03	Mini-Circuits	High Pass Filter	VHP-39	HPF-03	3-10 GHz	24 Mo.	10/27/09
LSN-01	Electrometrics	50 uH LISN	FCC/VDE 50/2	1001	0.01-30MHz	24 Mo.	06/14/11
MXR-02	HP / Agilent	Harmonic Mixer	11970K	2332A00489	18-26.5GHz	12 Mo.	04/05/11
PRE-01	Hewlett Packard	Preselector	85685A	2510A00143	20 Hz-2GHz	12 Mo.	04/05/11
REC-01	Hewlett Packard	Spectrum Analyzer	8566A	2106A02115, 2209A01349	30Hz-22GHz	12 Mo.	10/29/10
REC-03	Anritsu	Spectrum Analyzer	MS2601B	MT94589	0.01-2200MHz	12 Mo.	03/18/11
REC-07	Anritsu	Spectrum Analyzer	MS2601A	MT53067	0.01-2200MHz	12 Mo.	01/21/11
THM-02	Fluke	Temp/Humid Meter	971	93490471	N/A	24 Mo.	04/01/10

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.

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 EUT, after testing all modes of operation.

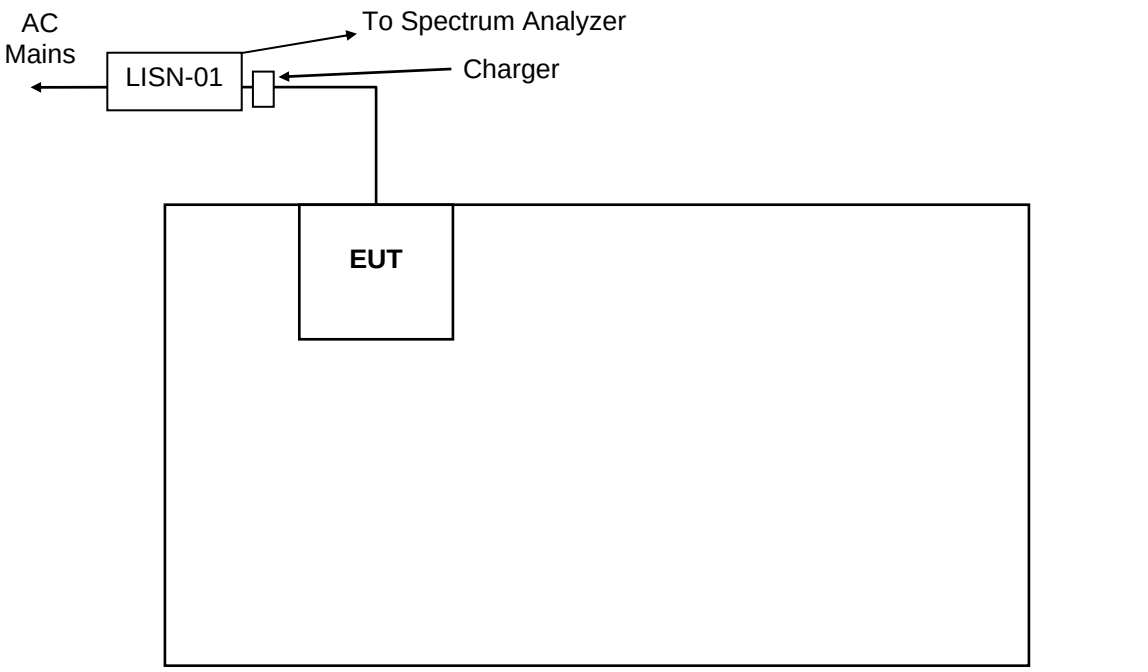
Test Date : September 23, 2011
The Amplitude is the final corrected value with cable and LISN Loss.

Lead Tested	Frequency MHz	QP Amplitude	QP Limit	Average Amplitude	Average Limit
AC Neutral	0.151	50.1	66.0	36.5	56.0
AC Neutral	0.232	49.2	62.4	34.3	52.4
AC Neutral	0.301	45.0	60.2	32.3	50.2
AC Neutral	0.377	42.9	58.3	29.4	48.3
AC Neutral	0.452	47.3	56.8	34.7	46.8
AC Neutral	0.530	45.3	56.0	30.0	46.0
AC Neutral	0.598	39.9	56.0	28.6	46.0
AC Neutral	0.751	40.7	56.0	26.0	46.0
AC Neutral	20.973	33.8	60.0	19.9	50.0
AC Hot	0.150	50.2	66.0	36.1	56.0
AC Hot	0.226	48.3	62.6	35.0	52.6
AC Hot	0.301	46.6	60.2	34.4	50.2
AC Hot	0.376	43.8	58.4	31.2	48.4
AC Hot	0.453	46.2	56.8	35.3	46.8
AC Hot	0.521	43.7	56.0	33.4	46.0
AC Hot	0.598	41.9	56.0	31.5	46.0
AC Hot	0.662	41.9	56.0	29.2	46.0
AC Hot	21.093	35.5	60.0	23.5	50.0

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

Judgment: Passed by 9.5 dB

Figure 1. Conducted Emissions Test Setup



Notes:
- LISN's at least 80 cm from EUT chassis
- Vertical conductive plane 40 cm from rear of table top
- EUT power cord bundled

10.2 Occupied Bandwidth

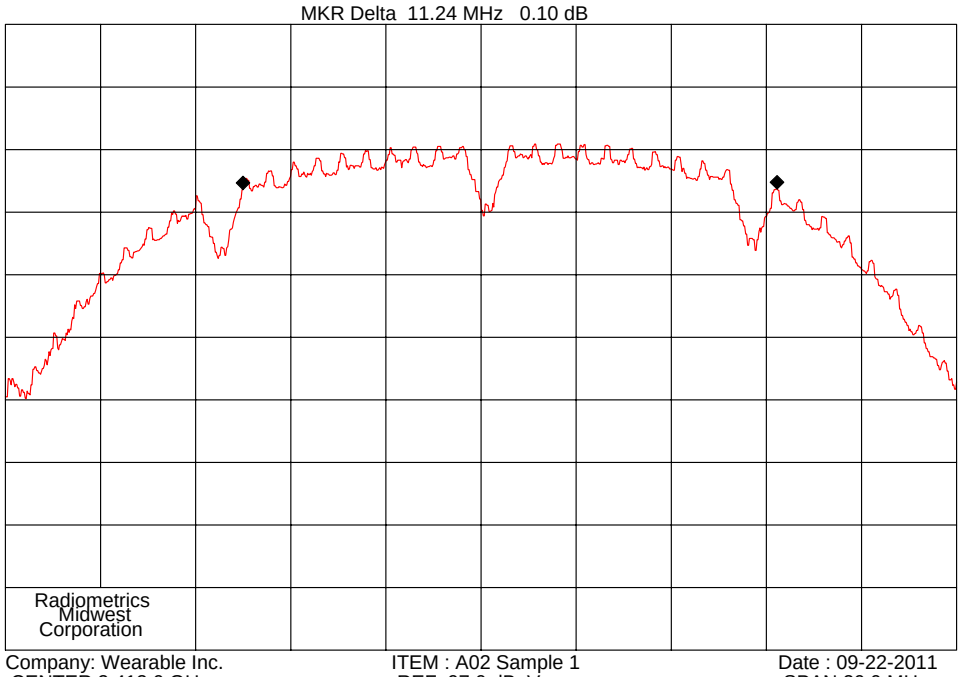
10.2.1 Occupied Bandwidth (6 dB)

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 6 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 6 dB bandwidth of the emission.

Channel	802.11b 6 dB EBW MHz	802.11g 6 dB EBW MHz	802.11n 6 dB EBW MHz
1	11.24	16.84	17.58
6	11.26	16.64	17.78
11	11.14	16.54	17.64

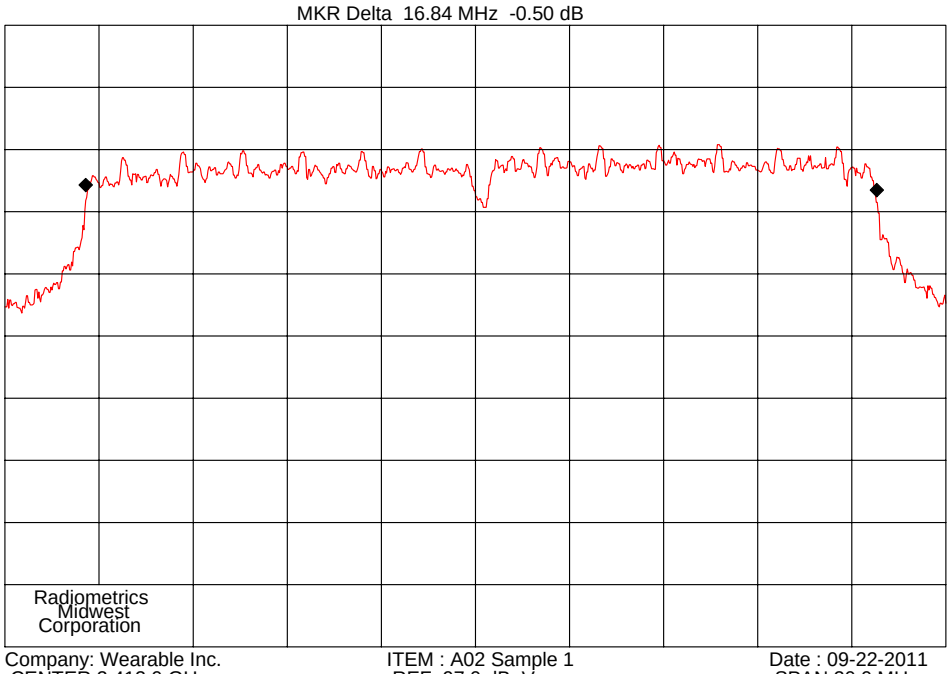
Judgement: Pass; All bandwidths are at least 500 kHz



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 13:52

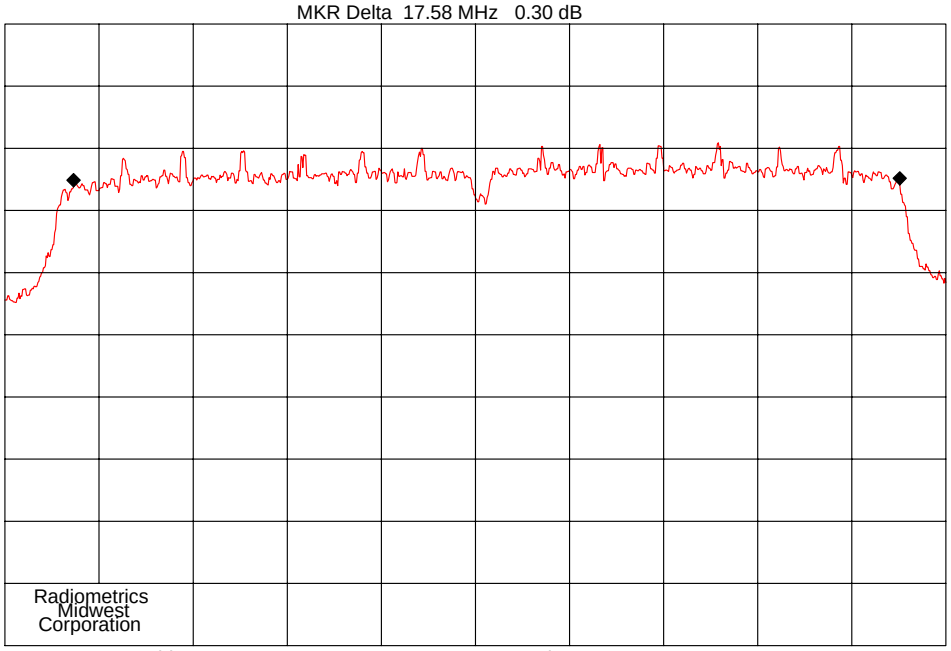
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW1B6



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11g

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 13:31

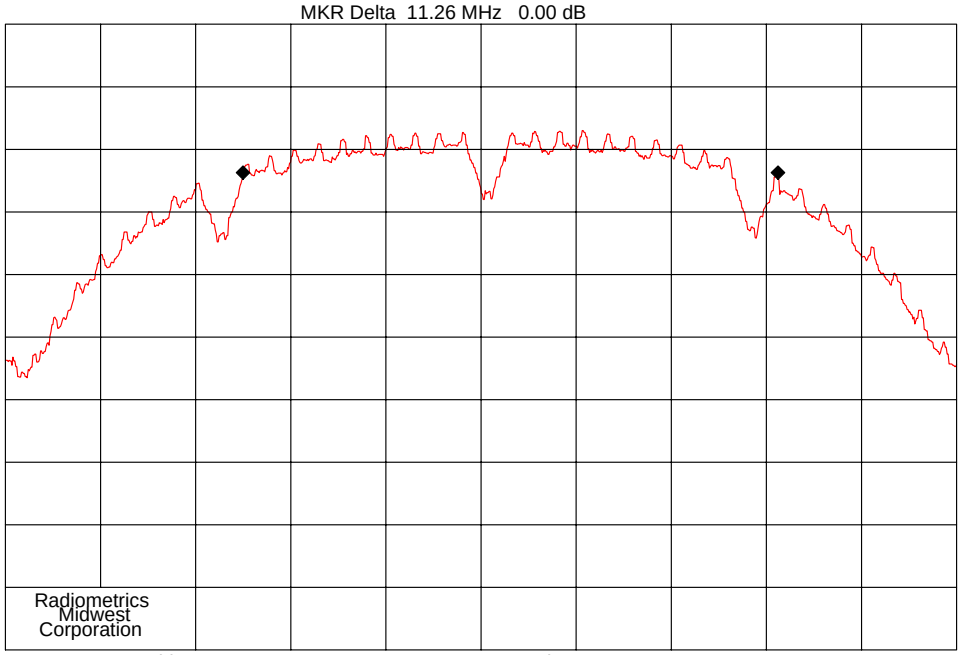
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW1G6



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11N

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 11:01

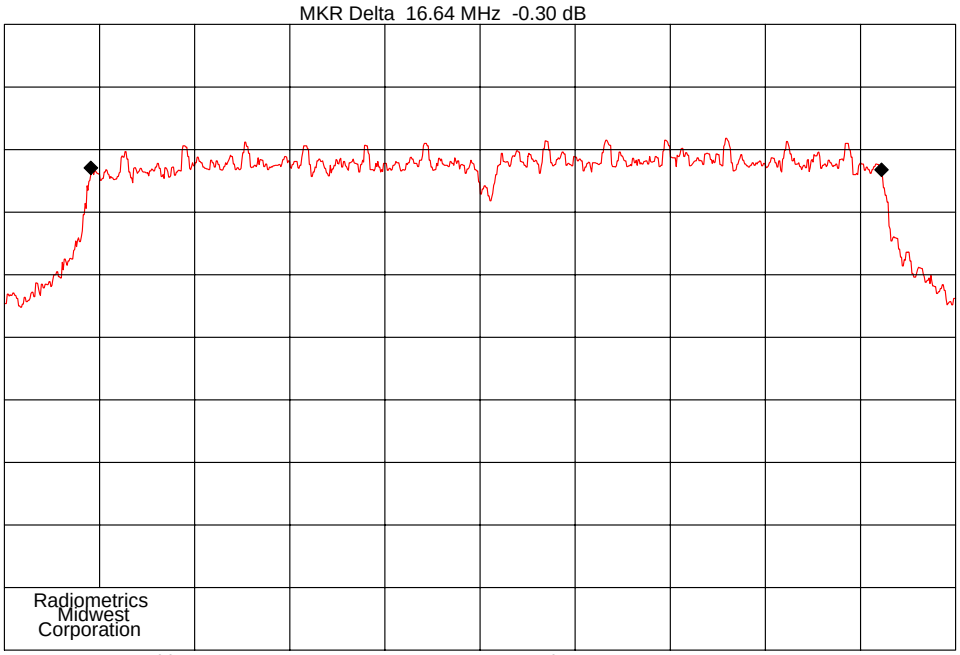
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW6N1



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 13:59

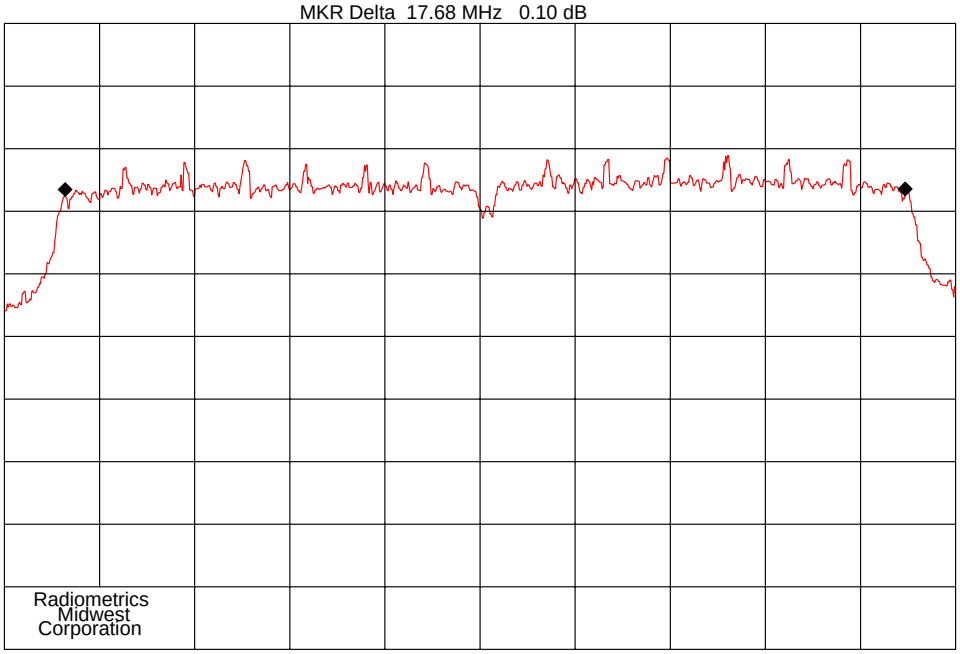
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW2B6



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11g

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 11:32

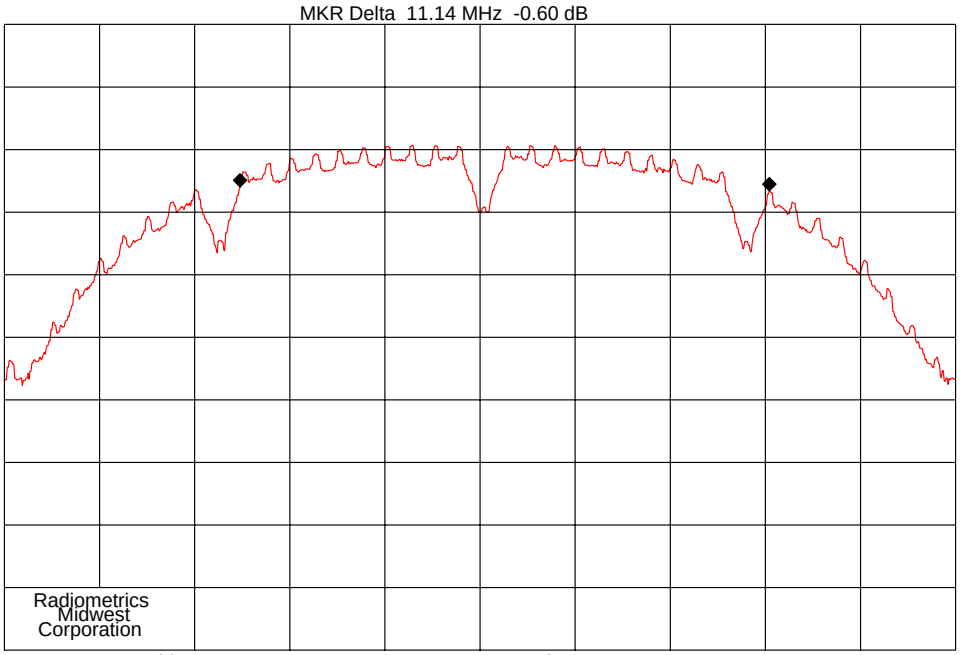
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW2G6



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11N

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 10:46

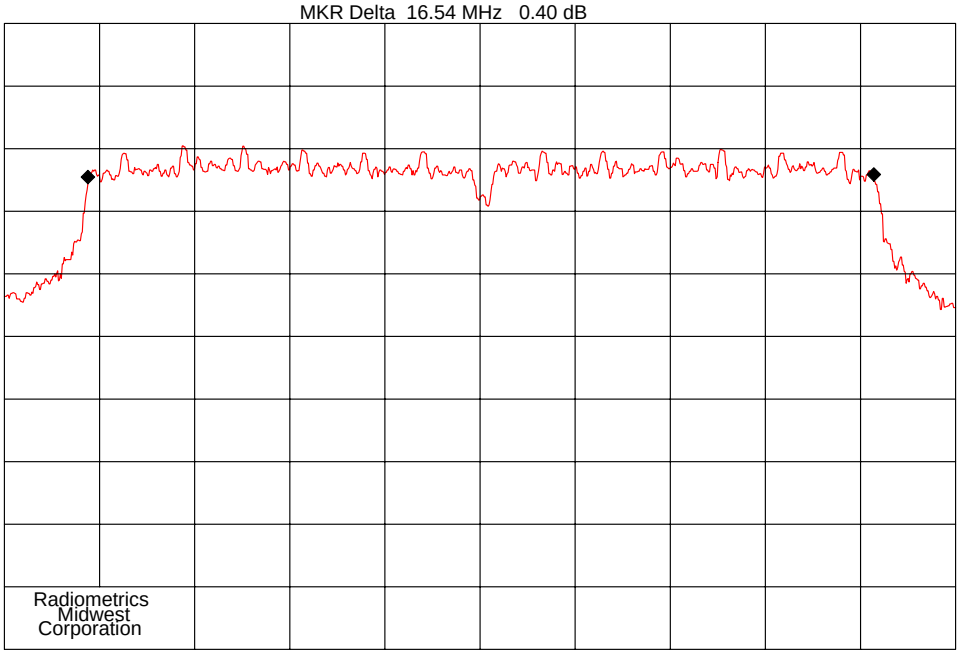
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW6N2



Company: Wearable Inc.
CENTER 2.462 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 14:08

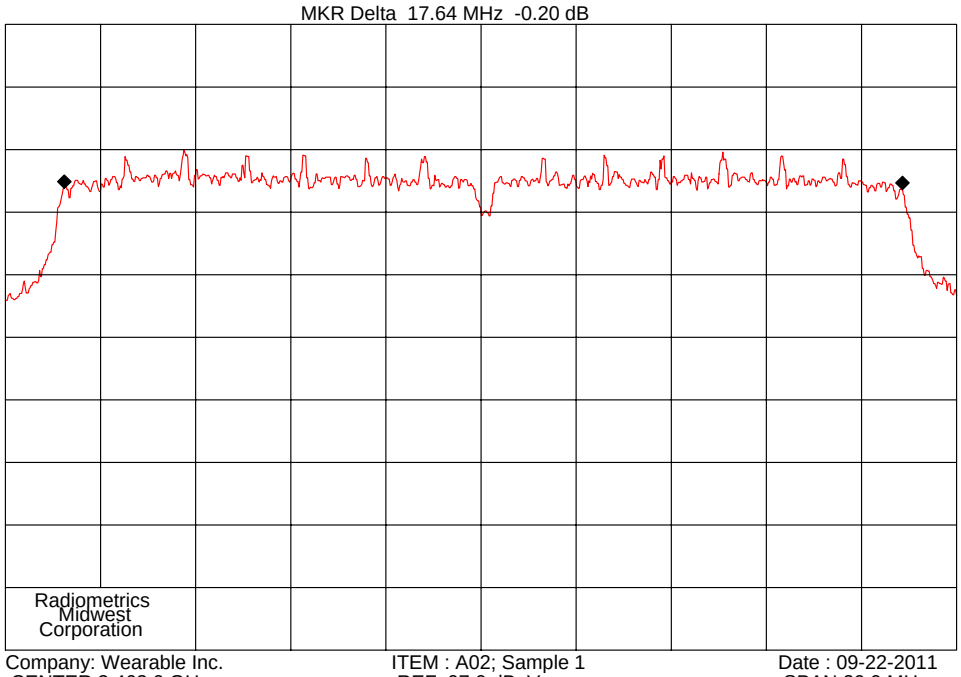
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW3B20



Company: Wearable Inc.
CENTER 2.462 0 GHz
RES BW 100 kHz
10 dB/
Notes: 6 dB Bandwidth, 802.11g

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 11:20

Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW1G6



10.2.2 Occupied Bandwidth (99%)

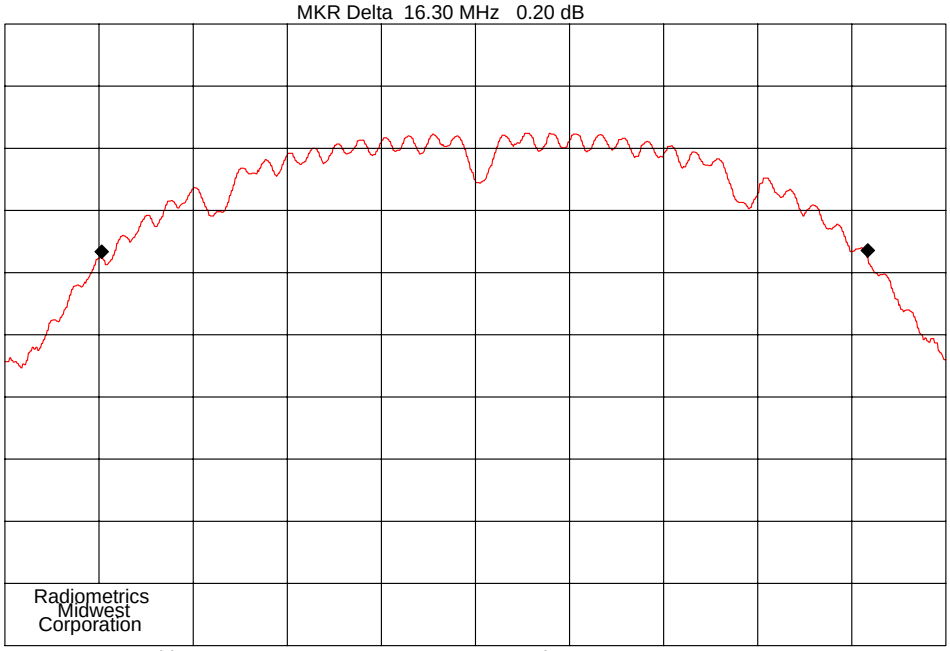
The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

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 6 dB bandwidth of the emission.

Channel	802.11b 99% Bandwidth MHz	802.11g 99% Bandwidth MHz	802.11n 99% Bandwidth MHz
1	16.30	19.18	20.83
6	16.36	19.40	21.80
11	16.34	19.15	21.05

Judgement: Pass; All bandwidths are at least 500 kHz

MKR Delta 16.30 MHz 0.20 dB

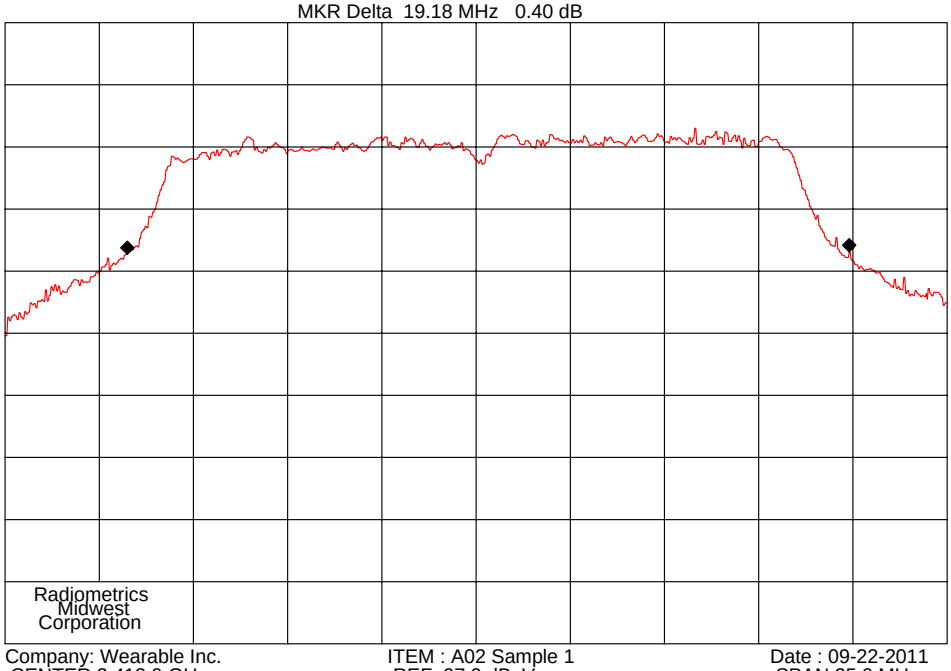


Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 13:54

Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW1B20

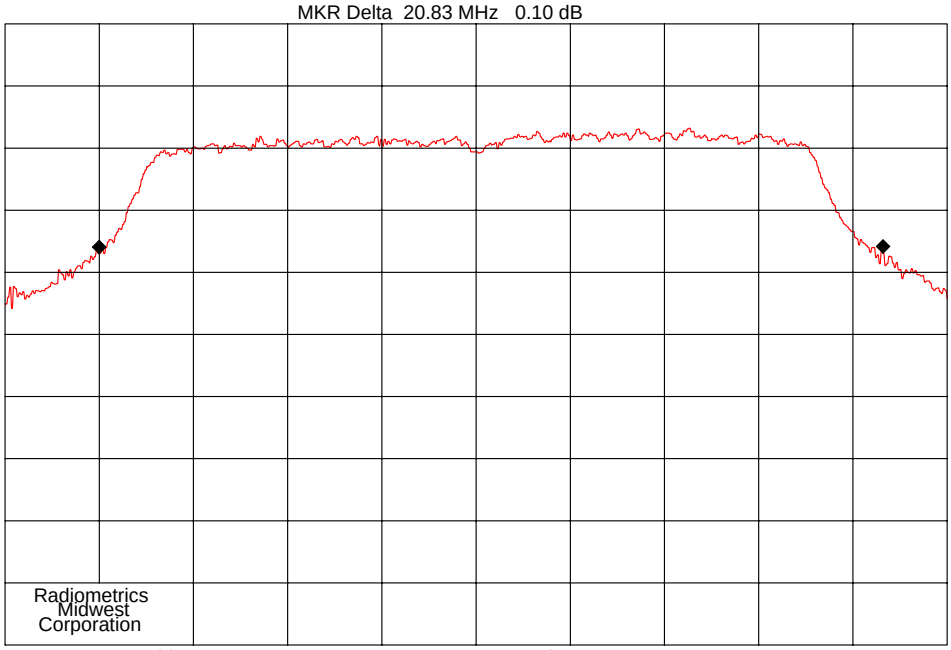
MKR Delta 19.18 MHz 0.40 dB



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11g

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 13:32

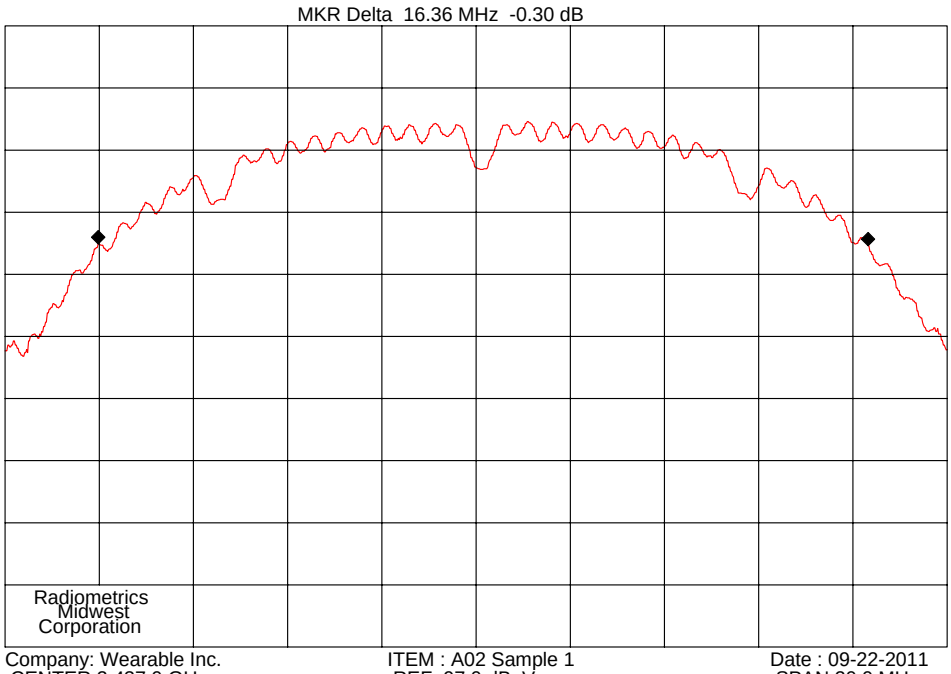
Date : 09-22-2011
SPAN 25.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW1G20



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11N

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 11:02

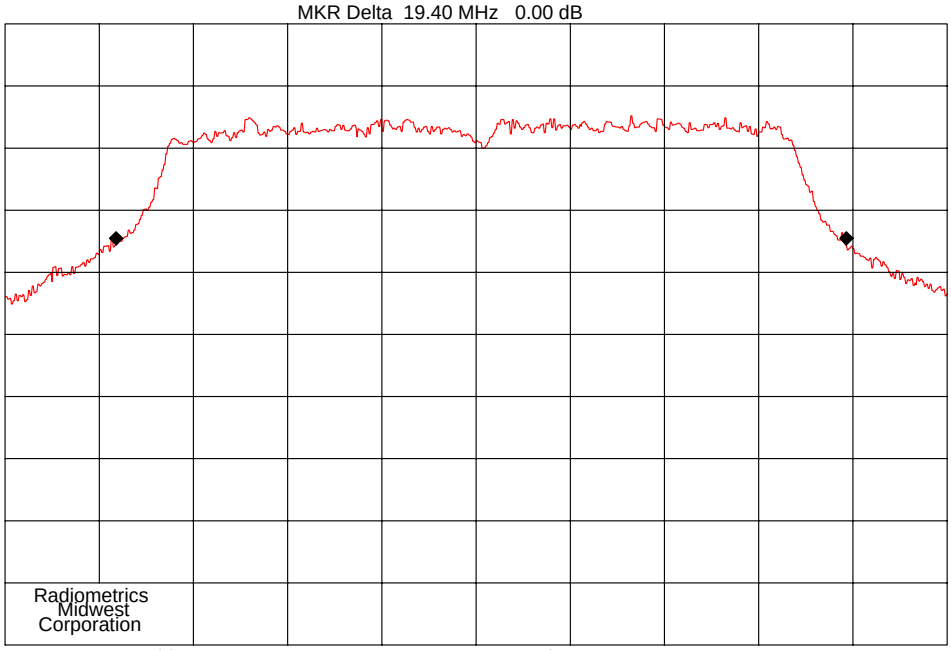
Date : 09-22-2011
SPAN 25.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW20N1



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 14:01

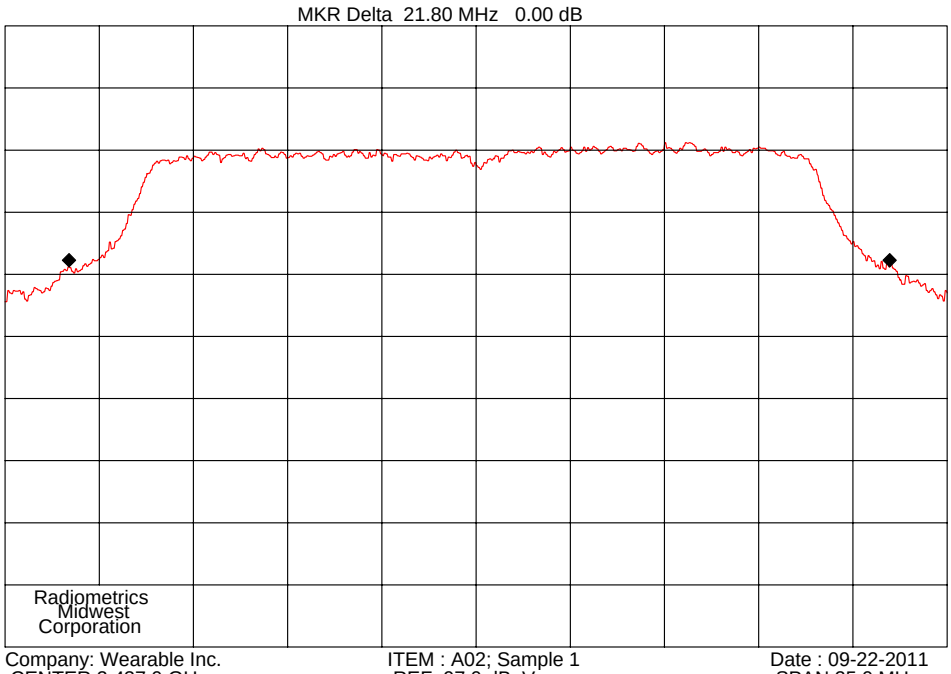
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW2B20



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11g

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 11:31

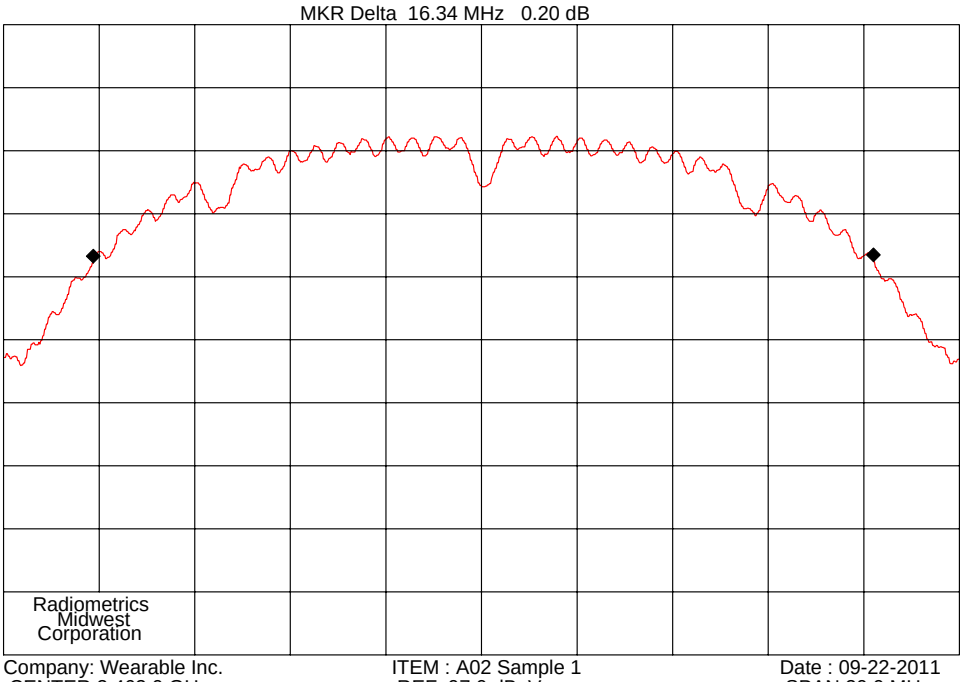
Date : 09-22-2011
SPAN 25.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW2G20



Company: Wearable Inc.
CENTER 2.437 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11N

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 10:48

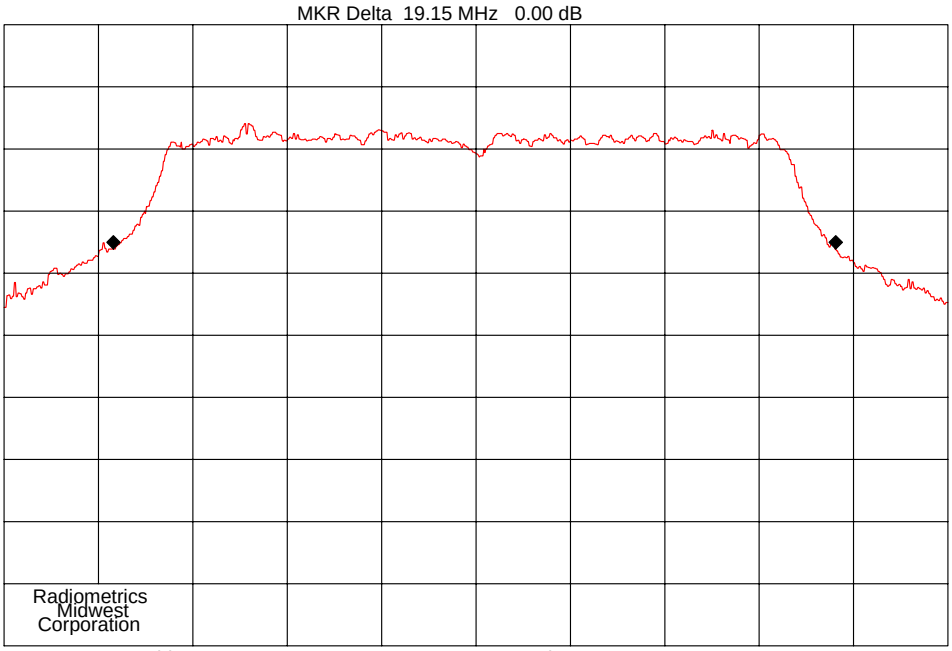
Date : 09-22-2011
SPAN 25.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW20N2



Company: Wearable Inc.
CENTER 2.462 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 14:07

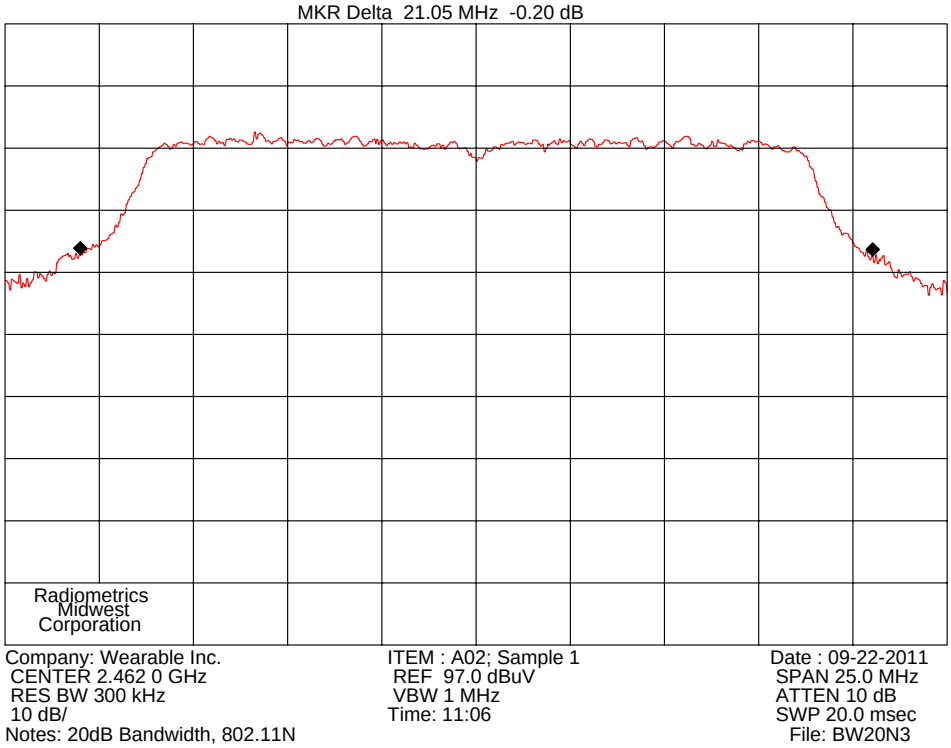
Date : 09-22-2011
SPAN 20.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW3B6



Company: Wearable Inc.
CENTER 2.462 0 GHz
RES BW 300 kHz
10 dB/
Notes: 20dB Bandwidth, 802.11g

ITEM : A02; Sample 1
REF 97.0 dBuV
VBW 1 MHz
Time: 11:23

Date : 09-22-2011
SPAN 25.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BW3G20



10.3 Peak Output Power

Since antenna conducted tests cannot be performed on the EUT, radiated tests were performed to show compliance with this requirement. The FCC procedures from power output option 2, Method #3 were used.

The transmitter's peak power was calculated using the following equation:
P = (E x d)^2 / (30)
Where: E = the measured maximum peak field strength in V/m.
d = Distance in meters from which the field strength was measured. (3 meters)
P = The EUT power in watts

The Field Strength was measured using the procedures described in section 10.9, with the exception of the resolution and video bandwidths. The spectrum analyzer was set to the following settings:

Span = 3 MHz ; RBW = 1 MHz (> the 20 dB bandwidth of the emission being measured)
VBW = 3 MHz; Sweep = auto; Detector function = peak; Trace = max hold
BW correction factor = 10*Log (EBW/1 MHz)

Since the gain of the antenna is always less than 6dB, the limit is not reduced.
Limit = 30

Function	MHz	dBuV/m peak	V/m	Test Dist meters	Uncorrected Power Watts	BW Corr Fact	Peak EUT dBm	Limit dBm
802.11b	2412	101.3	0.1161	3	4.05E-03	10.5	16.6	30
802.11b	2437	104.3	0.1641	3	8.07E-03	10.5	19.6	30
802.11b	2462	101	0.1122	3	3.78E-03	10.5	16.2	30

Function	MHz	dBuV/m peak	V/m	Test Dist meters	Uncorrected Power Watts	BW Corr Fact	Peak EUT dBm	Limit dBm
802.11g	2412	103	0.1413	3	5.99E-03	12.5	20.3	30
802.11g	2437	104.8	0.1738	3	9.06E-03	12.2	21.8	30
802.11g	2462	104.6	0.1698	3	8.65E-03	12.2	21.6	30
802.11N	2412	102.8	0.1380	3	5.72E-03	12.5	20.0	30
802.11N	2437	103.8	0.1549	3	7.20E-03	12.5	21.0	30
802.11N	2462	104.1	0.1603	3	7.71E-03	12.5	21.3	30

Overall Test result: Pass by 8.2 dB

10.4 Power Spectral Density

Since antenna conducted tests cannot be performed on the EUT, radiated tests were performed to show compliance with this requirement. The FCC procedures from PSD option 1 was used. The power spectral density was measured as follows.

The field strength was measured using the procedures described in section 10.9, with the following exceptions: The analyzer was tuned to the highest point of the maximized fundamental emission. The analyzer was set to RBW = 3 kHz, VBW > RBW, span = 300 kHz and a sweep = 100 Sec. Using this peak level, the transmitter's power spectral density was calculated using the following equation:

P = (E x d)^2 / (30)

Where: E = the measured maximum peak field strength in V/m, using the bandwiths in this section.
d = Distance in meters from which the field strength was measured. (3 meters)
P = The EUT power in watts

Battery Powered

	Freq	3kHz PSD Field Strength		Test Distance	3 kHz Spectral Density from EUT		Limit
EUT	MHz	dBuV/m	V/m	Meters	Watts	dBm	dBm
802.11b	2412	79.7	0.0097	3	2.80E-05	-15.5	8
802.11b	2437	83.1	0.0143	3	6.13E-05	-12.1	8
802.11b	2462	79.5	0.0094	3	2.67E-05	-15.7	8
802.11g	2412	80.1	0.0101	3	3.07E-05	-15.1	8
802.11g	2437	81.9	0.0124	3	4.65E-05	-13.3	8
802.11g	2462	81.6	0.0120	3	4.34E-05	-13.6	8
802.11N	2412	80.2	0.0102	3	3.14E-05	-15.0	8
802.11N	2437	80.9	0.0111	3	3.69E-05	-14.3	8
802.11N	2462	82.8	0.0138	3	5.72E-05	-12.4	8

Overall Test result: Pass by 20.1 dB

10.5 Average power

These measurements were made with an 18 GHz crystal RF detector. FCC part 15 and RSS-210 do not have limits on average power. The purpose of this is for RF Exposure Compliance requirements. The EUT is under 20 mW in order to be exempt from SAR testing.

Since antenna conducted tests cannot be performed on the EUT, radiated tests were performed to show compliance with this requirement.

The average voltage level from the crystal detector. Using this level, the transmitter's power spectral density was calculated using the following equation:

P = (E x d)^2 / (30)

Where: E = the measured maximum Average field strength in V/m.
d = Distance in meters from which the field strength was measured. (3 meters)
P = The EUT power in watts

	Freq.	Average Reading at Detector	Atten Loss	Ant, Amp & cable	Field Strength	Test Distance	Equivalent Power
Mode	MHz	dBuV	dB	dB/m	dBuV/m	meters	mW
802.11b	2412	93.5	10.0	1.7	105.2	3.0	9.9
802.11b	2437	94.9	10.0	1.8	106.7	3.0	14.0
802.11b	2462	92.5	10.0	2.0	104.5	3.0	8.5
802.11g	2412	92.9	10.0	1.7	104.6	3.0	8.7
802.11g	2437	94.2	10.0	1.8	106.0	3.0	11.9
802.11g	2462	93.7	10.0	2.0	105.7	3.0	11.1
802.11 N	2412	92.7	10.0	1.7	104.4	3.0	8.3
802.11 N	2437	93.3	10.0	1.8	105.1	3.0	9.7
802.11 N	2462	93.3	10.0	2.0	105.3	3.0	10.2

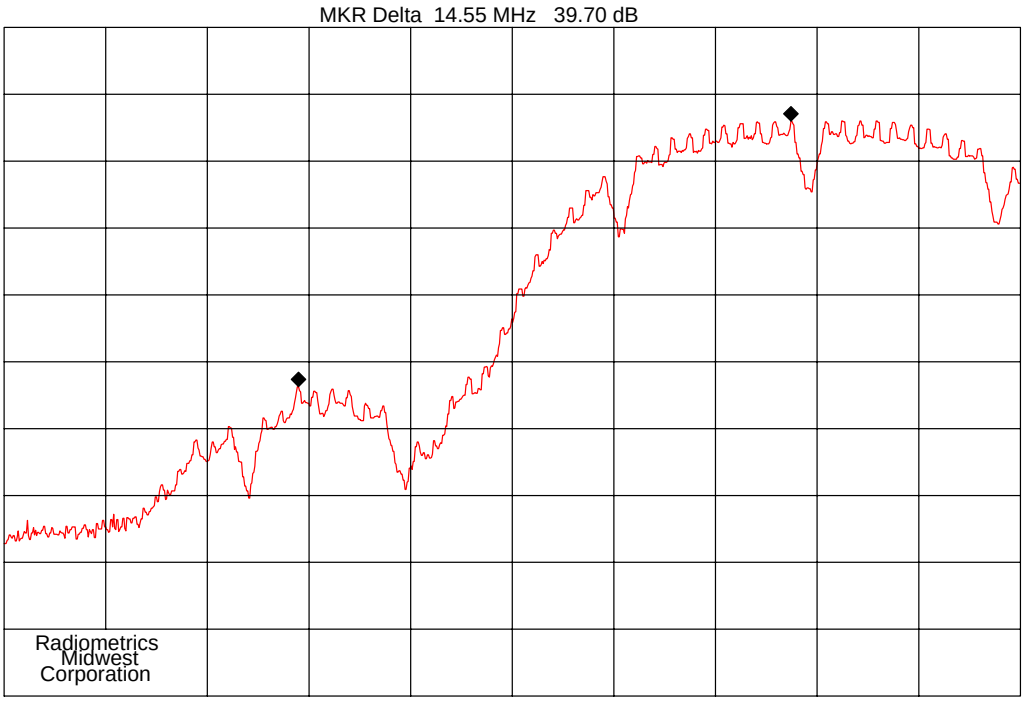
Since the average power output is 14.0 mW, The EUT meets the FCC requirement for RF exposure for handheld devices with no SAR testing required.

10.6 Band-edge Compliance of RF Conducted 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.

Channel	Band Edge Delta Readings in dB			
	802.11b	802.11g	802.11N	Limit
2412 Lower Band edge	39.7	30.4	29.0	20
2462 Upper Band edge	54.4	42.3	42.9	20

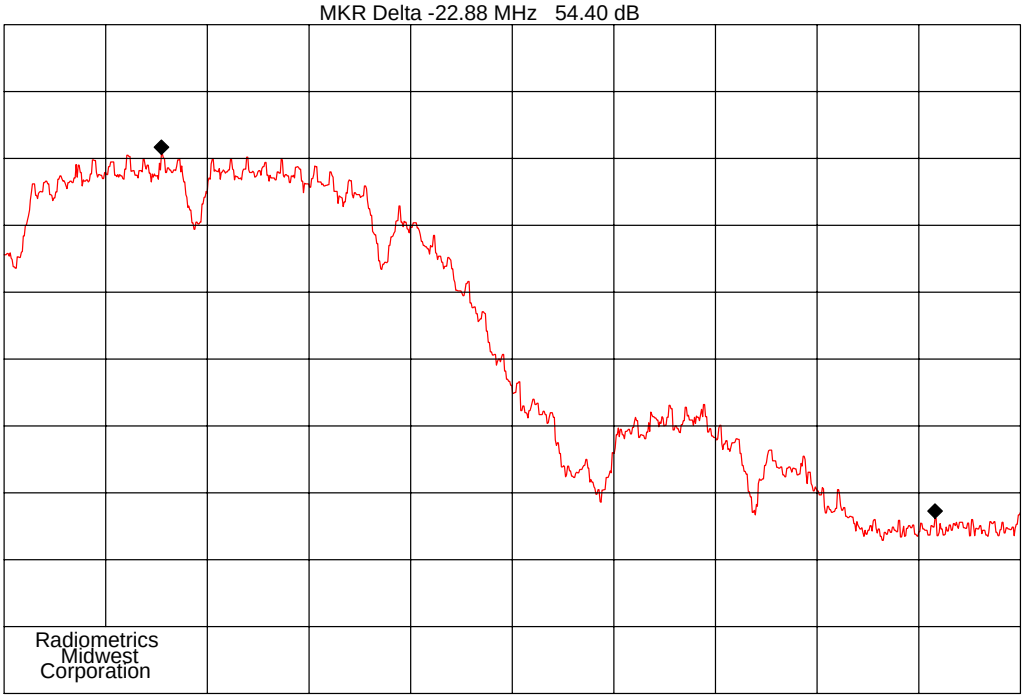
Judgement: Pass by 9 dB



Company: Wearable Inc.
CENTER 2.403 3 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge; 2400 MHz, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 15:04

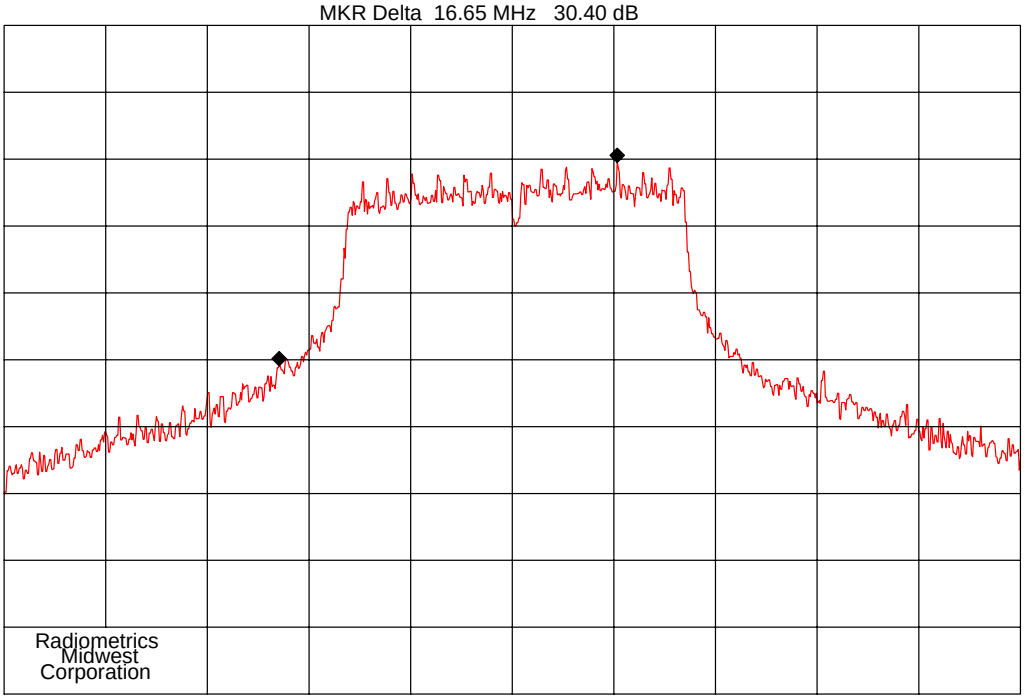
Date : 09-22-2011
SPAN 30.0 MHz
ATTEN 0 dB
SWP 20.0 msec
File: BE2-B3



Company: Wearable Inc.
CENTER 2.471 3 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge, 802.11b

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 14:15

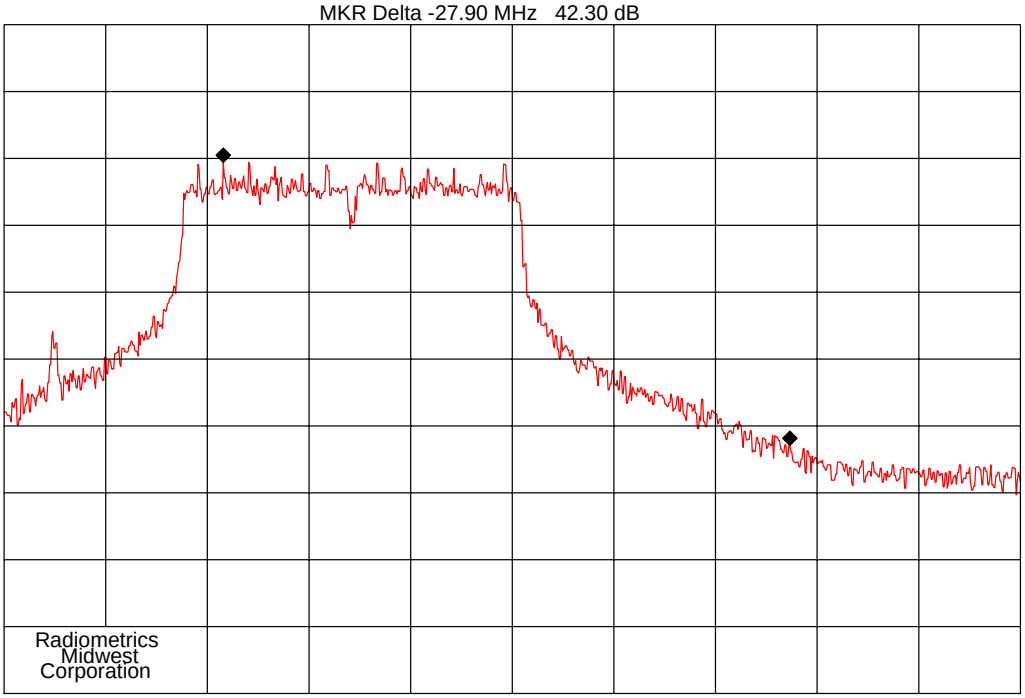
Date : 09-22-2011
SPAN 30.0 MHz
ATTEN 0 dB
SWP 20.0 msec
File: BE2-B



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge; 2400 MHz, 802.11g

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 13:38

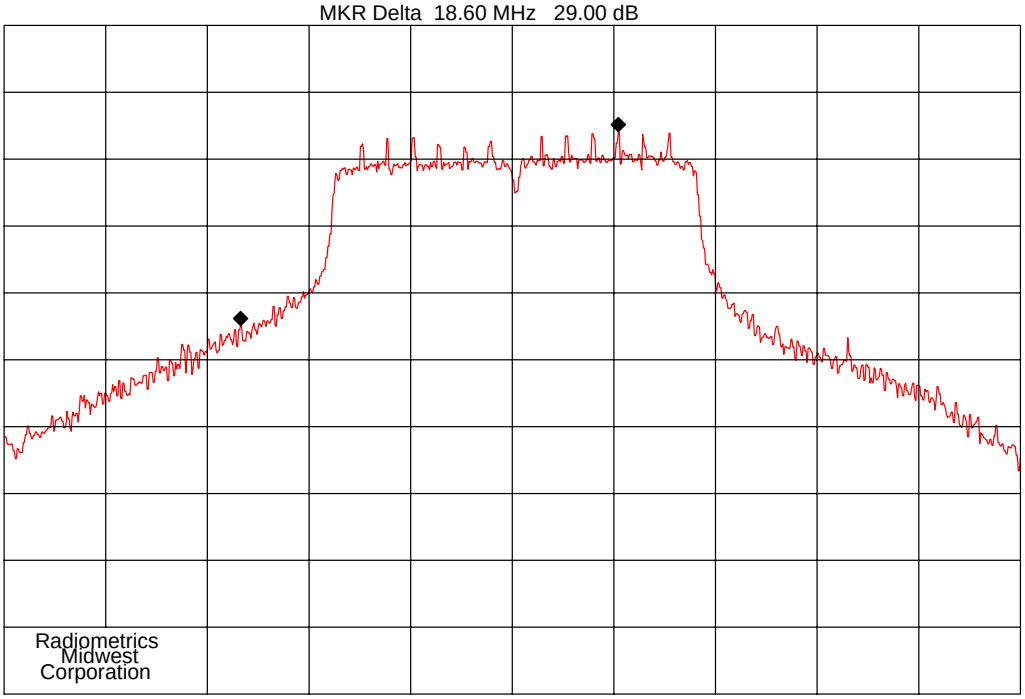
Date : 09-22-2011
SPAN 50.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BE1G-B



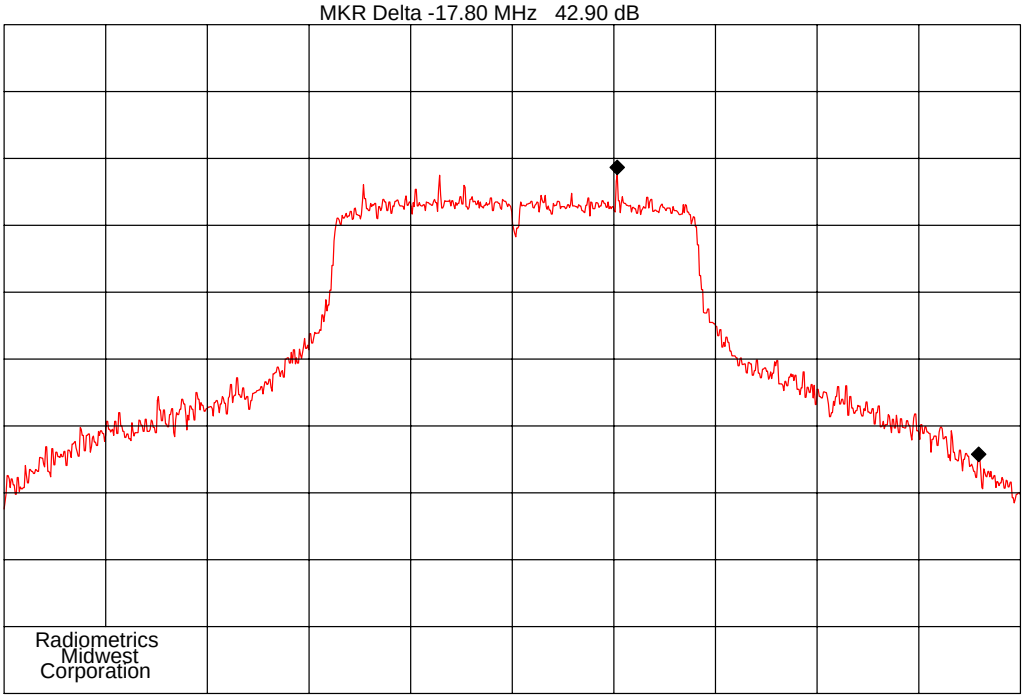
Company: Wearable Inc.
CENTER 2.470 0 GHz
RES BW 100 kHz
10 dB/
Notes: Band Edge, 802.11g

ITEM : A02 Sample 1
REF 97.0 dBuV
VBW 300 kHz
Time: 13:42

Date : 09-22-2011
SPAN 50.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BE2G-B



Company: Wearable Inc.
CENTER 2.412 0 GHz
RES BW 100 kHz
10 dB/
ITEM : A02; Sample 1
REF 107.0 dBuV
VBW 1 MHz
Time: 10:18
Date : 09-22-2011
SPAN 50.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BE-1N2
Notes: Band Edge 2400 MHz, 802.11N; 24 dB setting

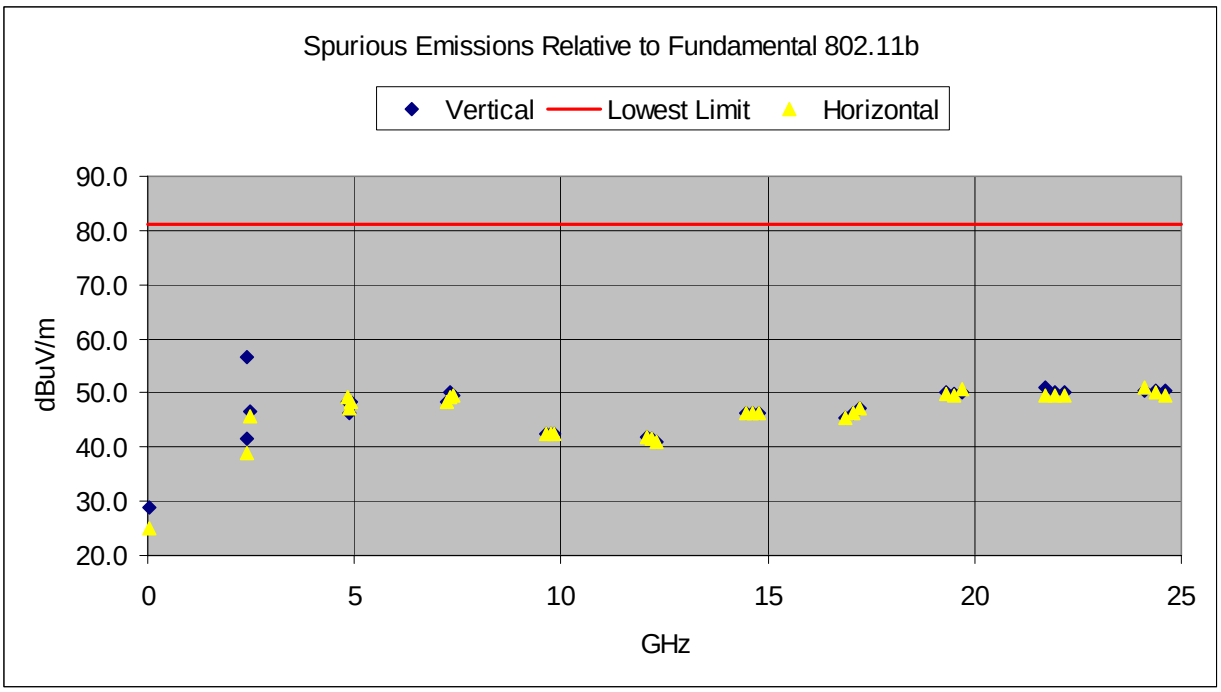


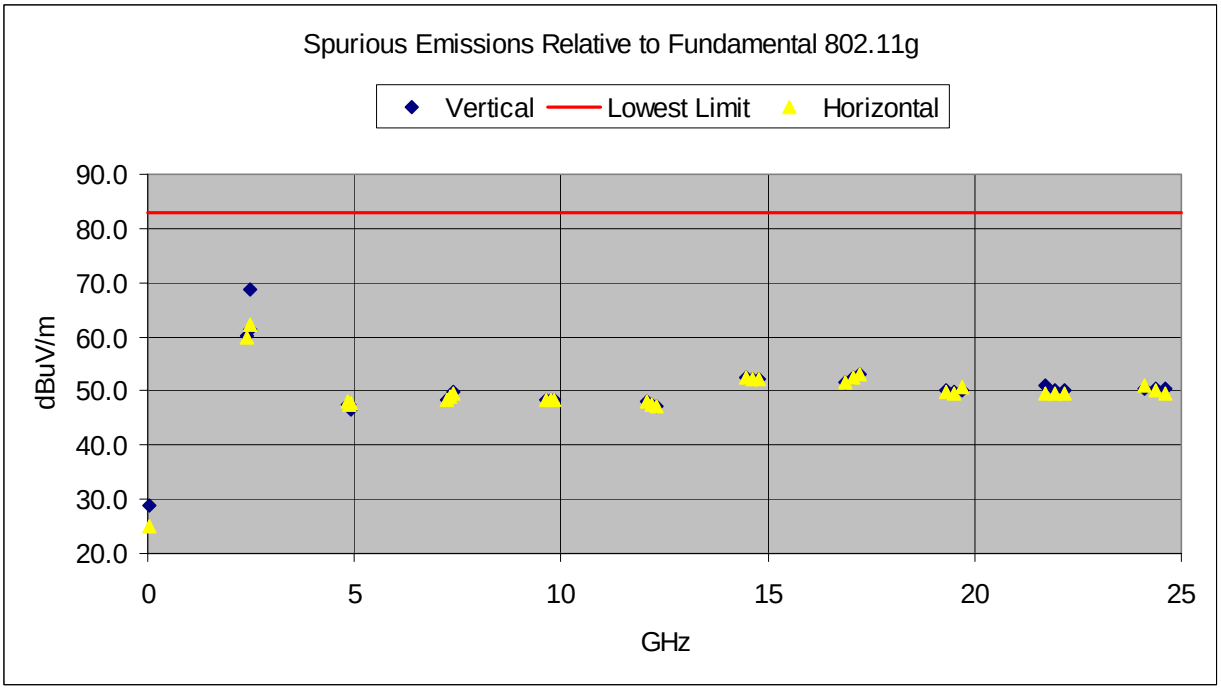
Company: Wearable Inc.
CENTER 2.462 0 GHz
RES BW 100 kHz
10 dB/
ITEM : A02; Sample 1
REF 107.0 dBuV
VBW 300 kHz
Time: 17:45
Date : 09-21-2011
SPAN 50.0 MHz
ATTEN 10 dB
SWP 20.0 msec
File: BE-2N3
Notes: Band Edge, 802.11N; 24 dB setting

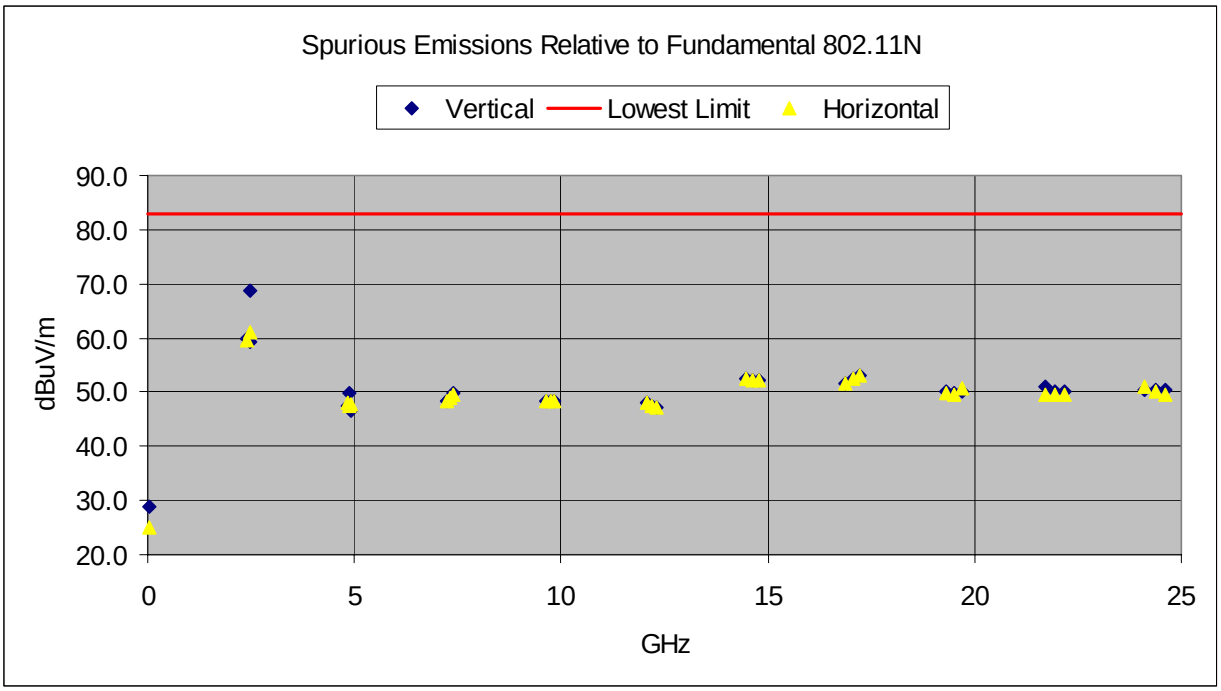
10.7 Spurious RF Conducted Emissions

Since antenna conducted tests cannot be performed on the EUT, radiated tests were performed to show compliance with this requirement.

The EUT was tested in continous mode and peak readings were made from the lowest frequency generated in the EUT up through the 10th harmonic. The limit is 20 dB lower than the peak of the lowest fundamental. The data is shown graphically.







Judgement: Pass by 12.5 dB

10.8 Spurious Radiated Emissions (Restricted Band)

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 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 25000 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.

10.8.1 Radiated Emissions Field Strength Sample Calculation

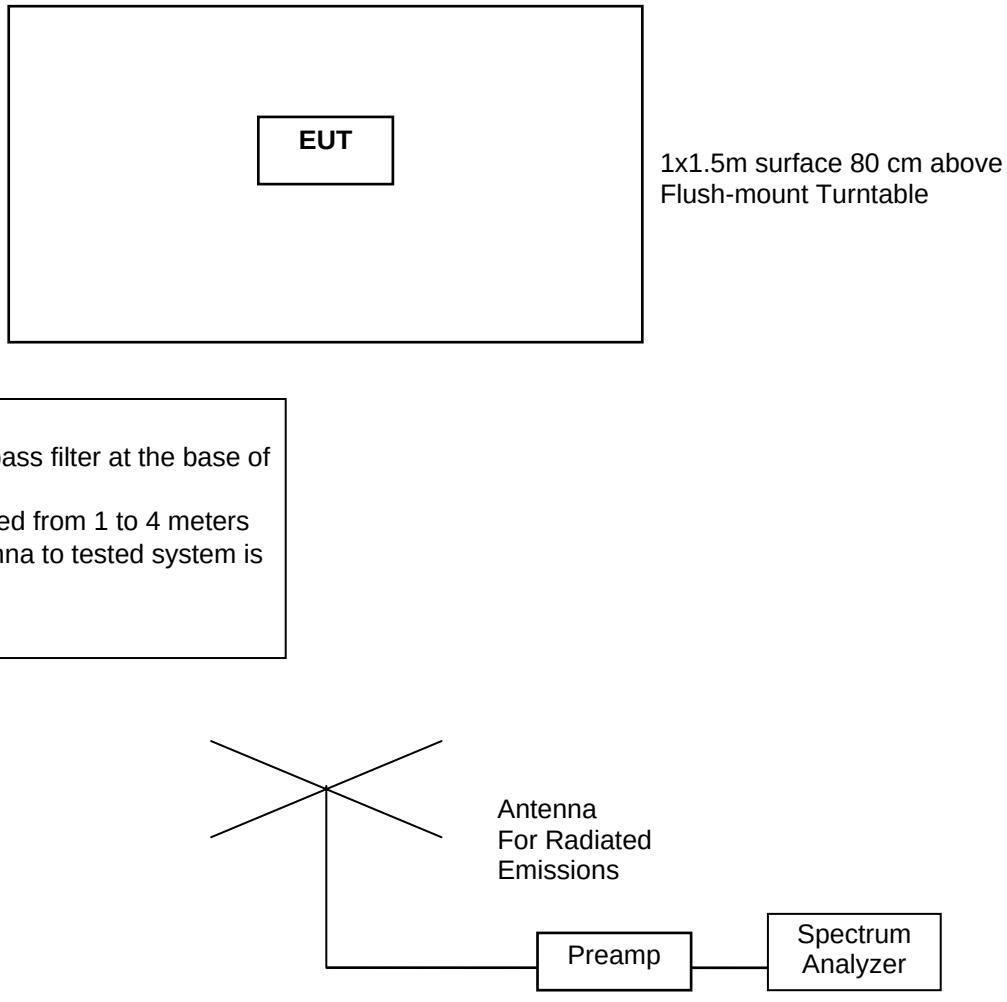
The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation is as follows:

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

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 2. Drawing of Radiated Emissions Setup



10.8.2 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
Detector function = peak
Trace = max hold
A Video Bandwidth of 10 Hz was used for Average measurements above 1 GHz.

Manufacturer	Wearable Inc.	Specification	FCC Part 15 Subpart C & RSS-210
Model	A02	Test Date	9-24-11
Serial Number	Sample 1	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 + antenna factor		
Configuration	USB Charge and transmit mode		

Spurious emissions below 3 GHz

Freq. MHz	Analyzer Reading dBuv	Detector Function	Antenna Polarity	Corr. Factors dB	Signal Field Strength dBuV/M	Limit Field Strength dBuV/M	Margin Under Limit dB
53.6	27.8	P	H	-5.5	22.3	40.0	17.7
155.6	29.1	P	H	-7.9	21.2	43.5	22.3
174.8	29.8	P	H	-8.5	21.3	43.5	22.2
198.8	30.6	P	H	-8.2	22.4	43.5	21.1
222.0	29	P	H	-6.3	22.7	46.0	23.3
284.6	34.7	P	H	-5.1	29.6	46.0	16.4
294.2	36.6	P	H	-5.1	31.5	46.0	14.5
300.6	32.8	P	H	-4.7	28.1	46.0	17.9
389.8	28.4	P	H	-2.6	25.8	46.0	20.2
1006.8	47.8	P	H	-2.2	45.6	74.0	28.4
1022.7	56.1	P	H	-2.1	54.0	74.0	20.0
1022.9	50.1	A	H	-2.1	48.0	54.0	6.0
1023.0	50.5	P	H	-2.1	48.4	74.0	25.6
1023.3	50.0	A	H	-2.1	47.9	54.0	6.1
1039.0	44.8	P	H	-1.9	42.9	74.0	31.1
1055.5	55.4	P	H	-1.8	53.6	74.0	20.4
1055.9	49.2	A	H	-1.8	47.4	54.0	6.6
1080.6	46.5	P	H	-1.7	44.8	74.0	29.2
1088.1	50.6	P	H	-1.7	48.9	74.0	25.1
1181.4	49.0	P	H	-0.7	48.3	74.0	25.7
1200.8	41.9	P	H	-0.7	41.2	74.0	32.8
1248.0	41.6	P	H	-0.7	40.9	74.0	33.1
1575.0	35.0	P	H	0.1	35.1	74.0	38.9
1583.3	44.2	P	H	0.1	44.3	74.0	29.7
1846.0	44.1	P	H	1.9	46.0	74.0	28.0
2667.0	38.5	P	H	4.8	43.3	74.0	30.7

2668.8	28.3	A	H	4.8	33.1	54.0	20.9
2669.5	36.5	P	H	4.8	41.3	74.0	32.7
50.8	29.1	P	V	-4.8	24.3	40.0	15.7
75.2	36.4	P	V	-11.4	25	40.0	15.0
82.0	37.1	P	V	-11.2	25.9	40.0	14.1
101.6	32.4	P	V	-7.9	24.5	43.5	19.0
120.0	30.9	P	V	-3.8	27.1	43.5	16.4
144.4	32.7	P	V	-7.8	24.9	43.5	18.6
164.0	34.9	P	V	-7.9	27	43.5	16.5
176.8	36.1	P	V	-8.5	27.6	43.5	15.9
198.8	31.1	P	V	-8.2	22.9	43.5	20.6
219.2	28.2	P	V	-6.4	21.8	46.0	24.2
227.8	34.4	P	V	-6.2	28.2	46.0	17.8
233.8	32.5	P	V	-5.9	26.6	46.0	19.4
293.0	34.8	P	V	-5.1	29.7	46.0	16.3
308.6	36.5	P	V	-4.3	32.2	46.0	13.8
315.4	33.4	P	V	-4.2	29.2	46.0	16.8
450.0	30.1	P	V	-1.5	28.6	46.0	17.4
644.2	25.1	P	V	2.1	27.2	46.0	18.8
1007.4	44.5	P	V	-2.2	42.3	74.0	31.7
1022.8	45.1	P	V	-2.1	43.0	74.0	31.0
1038.8	43.0	P	V	-1.9	41.1	74.0	32.9
1055.8	51.3	A	V	-1.8	49.5	54.0	4.5
1055.9	52.7	P	V	-1.8	50.9	74.0	23.1
1088.6	48.8	P	V	-1.7	47.1	74.0	26.9
1121.6	47.8	P	V	-1.2	46.6	74.0	27.4
1180.6	46.0	A	V	-0.7	45.3	54.0	8.7
1180.8	50.1	P	V	-0.7	49.4	74.0	24.6
1224.8	49.2	P	V	-0.8	48.4	74.0	25.6
1231.2	43.8	P	V	-0.8	43.0	74.0	31.0
1598.8	43.7	P	V	0.1	43.8	74.0	30.2
1680.0	42.7	P	V	0.5	43.2	74.0	30.8
1850.3	40.1	P	V	1.9	42.0	74.0	32.0
2822.3	38.9	P	V	5.3	44.2	74.0	29.8
3834.3	37.6	P	V	9.6	47.2	74.0	26.8

Judgment: Passed by 4.5 dB
No other emissions were detected in the restricted bands.

10.8.3 Radiated Emissions above 2 GHz (802.11b)

		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	X	Y	Z	Max	X	Y	Z	Max	Fact.	Freq MHz	dBuV/m		dBuV/m		Limit
1	2412	88.8	92.0	99.6	95.9	97.0	89.1	95.3	94.4	1.7	2412	101.3	97.6	125	115	17.4
BE	2412	29.1	32.3	39.9	36.2	37.3	29.4	35.6	34.7	1.7	2400	41.6	37.9	74	54	16.1
2	2412	40.0	38.5	37.0	36.9	39.0	40.8	38.9	37.7	8.4	4824	49.2	46.1	74	54	7.9
3	2412	36.0	36.0	36.0	32.9	36.0	36.0	36.0	32.9	12.5	7236	48.5	45.4	74	54	8.6
4	2412	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	6.3	9648	42.3	35.3	74	54	18.7
1	2437	90.7	95.2	100.4	98.1	102.5	98.8	99.8	100.0	1.8	2437	104.3	101.8	125	115	13.2
2	2437	37.3	37.6	38.1	35.0	38.8	37.2	34.9	35.7	8.3	4874	47.1	44.0	74	54	10.0
3	2437	36.2	37.2	36.5	33.0	36.3	36.0	36.0	33.2	13.0	7311	50.2	46.2	74	54	7.8
4	2437	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	6.4	9748	42.4	35.4	74	54	18.6
1	2462	89.2	97.3	99.0	95.2	96.4	98.1	96.9	95.0	2.0	2462	101.0	97.2	125	115	17.8
BE	2462	34.8	42.9	44.6	40.8	42.0	43.7	42.5	40.6	2.0	2483.5	46.6	42.8	74	54	11.2
2	2462	39.5	40.1	39.7	37.0	38.5	37.8	40.0	36.9	8.3	4924	48.4	45.3	74	54	8.7
3	2462	36.0	36.0	36.0	32.9	36.0	36.0	36.0	32.9	13.4	7386	49.4	46.3	74	54	7.7
4	2462	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	6.5	9848	42.5	35.5	74	54	18.5
Column numbers (see below for explanations)																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Judgment: Passed by 6.0 dB

No other emissions were detected from 10 to 25 GHz.

Column #1. hrm = Harmonic; BE = Band Edge emissions
Column #2. Frequency of Transmitter.
Column #3. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #4. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #5. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #6. Average Reading based on peak reading reduced by the Duty cylce correction
Column #7. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #8. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #9. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #10. Average Reading based on peak reading reduced by the Duty cylce correction
Column #11. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor
Column #12. Frequency of Tested Emission
Column #13. Highest peak field strength at listed frequency.
Column #14. Highest Average field strength at listed frequency.
Column #15. Peak Limit.
Column #16. Average Limit.
Column #17. The margin (last column) is the worst case margin under the peak or average limits for that row.

10.8.4 Radiated Emissions above 2 GHz (802.11g)

		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	X	Y	Z	Max	X	Y	Z	Max	Fact.	Freq MHz	dBuV/m		dBuV/m		Limit
1	2412	92.1	97.8	101.3	92.9	101.0	90.7	99.6	92.6	1.7	2412	103.0	94.6	125	115	20.4
BE	2412	49.2	54.9	58.4	50.0	58.1	47.8	56.7	49.7	1.7	2390	60.1	51.7	74	54	2.3
2	2412	39.0	38.2	39.0	33.0	39.6	38.6	37.9	33.6	8.4	4824	48.0	42.0	74	54	12.0
3	2412	36.0	36.0	36.0	30.0	36.0	36.0	36.0	30.0	12.5	7236	48.5	42.5	74	54	11.5
4	2412	36.0	36.0	36.0	30.0	36.0	36.0	36.0	30.0	12.3	9648	48.3	42.3	74	54	11.7
1	2437	93.5	99.7	103.0	94.9	101.8	99.8	98.4	93.2	1.8	2437	104.8	96.7	125	115	18.3
2	2437	37.6	38.9	39.2	33.2	39.2	38.9	38.5	33.2	8.3	4874	47.5	41.5	74	54	12.5
3	2437	36.0	36.0	36.0	33.0	36.0	36.0	36.0	30.0	13.0	7311	49.0	46.0	74	54	8.0
4	2437	36.0	36.0	36.0	30.0	36.0	36.0	36.0	30.0	12.4	9748	48.4	42.4	74	54	11.6
1	2462	99.8	101.7	101.6	92.1	102.6	102.1	95.6	91.8	2.0	2462	104.6	94.1	125	115	20.4
BE	2462	57.5	59.4	59.3	49.8	60.3	59.8	53.3	49.5	2.0	2483.5	62.3	51.8	74	54	2.2
2	2462	36.4	38.4	37.4	32.4	37.8	39.5	37.3	33.5	8.3	4924	47.8	41.8	74	54	12.2
3	2462	36.0	36.0	36.4	30.4	35.5	36.0	36.0	30.0	13.4	7386	49.8	43.8	74	54	10.2
4	2462	36.0	36.0	36.0	30.0	36.0	36.0	36.0	30.0	12.5	9848	48.5	42.5	74	54	11.5
Column numbers (see below for explanations)																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Judgment: Passed by 2.2 dB

No other emissions were detected from 10 to 25 GHz.

Column #1. hrm = Harmonic; BE = Band Edge emissions
Column #2. Frequency of Transmitter.
Column #3. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #4. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #5. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #6. Average Reading based on peak reading reduced by the Duty cylce correction
Column #7. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #8. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #9. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #10. Average Reading based on peak reading reduced by the Duty cylce correction
Column #11. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor
Column #12. Frequency of Tested Emission
Column #13. Highest peak field strength at listed frequency.
Column #14. Highest Average field strength at listed frequency.
Column #15. Peak Limit.
Column #16. Average Limit.
Column #17. The margin (last column) is the worst case margin under the peak or average limits for that row.

10.8.5 Radiated Emissions above 2 GHz (802.11N)

		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	X	Y	Z	Max	X	Y	Z	Max	Fact.	Freq MHz	dBuV/m		dBuV/m		Limit
1	2412	97.8	98.5	101.1	93.4	101.0	94.1	95.7	93.2	1.7	2412	102.8	95.1	125	115	19.9
BE	2412	54.8	55.5	58.1	50.4	58.0	51.1	52.7	50.2	1.7	2390	59.8	52.1	74	54	1.9
2	2412	39.0	38.2	39.0	33.0	39.6	38.6	37.9	33.6	8.4	4824	48.0	42.0	74	54	12.0
3	2412	36.0	36.0	36.0	30.0	36.0	36.0	36.0	30.0	12.5	7236	48.5	42.5	74	54	11.5
4	2412	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	12.3	9648	48.3	41.3	74	54	12.7
1	2437	92.6	95.8	101.6	94.5	102.0	92.6	98.2	96.0	1.8	2437	103.8	97.8	125	115	17.2
2	2437	37.6	38.9	41.6	35.6	39.2	38.9	38.5	33.2	8.3	4874	49.9	43.9	74	54	10.1
3	2437	36.0	36.0	36.0	33.0	36.0	36.0	36.0	30.0	13.0	7311	49.0	46.0	74	54	8.0
4	2437	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	12.4	9748	48.4	41.4	74	54	12.6
1	2462	96.1	99.8	100.3	92.7	102.1	95.4	101.0	92.9	2.0	2462	104.1	94.9	125	115	20.1
BE	2462	53.2	56.9	57.4	49.8	59.2	52.5	58.1	50.0	2.0	2483.5	61.2	52.0	74	54	2.0
2	2462	36.4	38.4	37.4	32.4	37.8	39.5	37.3	33.5	8.3	4924	47.8	41.8	74	54	12.2
3	2462	36.0	36.0	36.4	30.4	35.5	36.0	36.0	30.0	13.4	7386	49.8	43.8	74	54	10.2
4	2462	36.0	36.0	36.0	29.0	36.0	36.0	36.0	29.0	12.5	9848	48.5	41.5	74	54	12.5
Column numbers (see below for explanations)																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Judgment: Passed by 1.9 dB

No other emissions were detected from 10 to 25 GHz.

Column #1. hrm = Harmonic; BE = Band Edge emissions
Column #2. Frequency of Transmitter.
Column #3. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #4. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #5. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #6. Average Reading based on peak reading reduced by the Duty cylce correction
Column #7. Uncorrected readings from the spectrum analyzer with First Axis Rotation.
Column #8. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.
Column #9. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.
Column #10. Average Reading based on peak reading reduced by the Duty cylce correction
Column #11. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor
Column #12. Frequency of Tested Emission
Column #13. Highest peak field strength at listed frequency.
Column #14. Highest Average field strength at listed frequency.
Column #15. Peak Limit.
Column #16. Average Limit.
Column #17. The margin (last column) is the worst case margin under the peak or average limits for that row.

10.9 Unintentional Emissions (Receive Mode)

Manufacturer	Wearable Inc.	Specification	FCC Part 15.247 & RSS-210
Model	A02	Test Date	07/20/2011
Serial Number	Sample 1	Test Distance	3 Meters
Abbreviations	Pol = Antenna Polarization; V = Vertical; H = Horizontal; P = peak; Q = QP		
Notes	Corr. Factors = Cable Loss – Preamp Gain – Duty Cycle Factor + HP Filter Loss		
Configuration	Receive mode		

Freq. MHz	Meter Reading dBuV	Dect. Type	Antenna		Corr. Factors dB	Field Strength dBuV/m		Margin Under Limit dB
			Factor dB	Pol/ ID#		EUT	Limit	
74.0	36.5	P	6.9	H/44	-18.2	25.2	40.0	14.8
146.4	40.1	P	10.1	H/44	-18.1	32.1	43.5	11.4
168.0	41.7	P	9.7	H/44	-17.9	33.5	43.5	10.0
191.6	45.0	P	9.6	H/44	-17.7	36.9	43.5	6.6
201.5	46.4	Q	9.7	H/44	-17.8	38.3	43.5	5.2
212.4	41.3	P	10.8	H/44	-17.8	34.3	43.5	9.2
227.6	36.8	P	11.6	H/44	-17.8	30.6	46.0	15.4
240.0	42.0	P	12.2	H/44	-17.8	36.4	46.0	9.6
251.4	40.1	P	12.7	H/44	-17.9	34.9	46.0	11.1
273.8	42.2	P	13.1	H/44	-17.8	37.5	46.0	8.5
281.4	42.9	P	13.0	H/44	-17.8	38.1	46.0	7.9
318.6	42.2	P	13.5	H/44	-17.8	37.9	46.0	8.1
326.2	42.4	P	13.5	H/44	-17.7	38.2	46.0	7.8
333.8	42.3	P	13.9	H/44	-17.7	38.5	46.0	7.5
348.6	44.8	P	14.9	H/44	-17.8	41.9	46.0	4.1
359.8	41.9	P	14.8	H/44	-17.8	38.9	46.0	7.1
419.0	35.1	P	16.9	H/44	-17.7	34.3	46.0	11.7
480.0	44.2	P	17.0	H/44	-17.7	43.5	46.0	2.5
720.0	36.4	P	19.5	H/44	-16.4	39.5	46.0	6.5
891.2	32.1	P	21.5	H/44	-15.7	37.9	46.0	8.1
908.0	33.3	P	21.9	H/44	-15.7	39.5	46.0	6.5
924.4	33.9	P	22.0	H/44	-15.6	40.3	46.0	5.7
940.8	33.8	P	22.3	H/44	-15.6	40.5	46.0	5.5
960.0	39.3	Q	22.4	H/44	-15.5	46.2	54.0	7.8
973.6	35.7	P	22.1	H/44	-15.5	42.3	54.0	11.7
990.0	36.0	P	22.6	H/44	-15.4	43.2	54.0	10.8
1006.4	32.0	P	23.3	H/44	-15.3	40.0	54.0	14.0
1022.8	32.1	P	23.4	H/44	-15.3	40.2	54.0	13.8
1200.0	28.4	P	24.5	H/44	-14.7	38.2	54.0	15.8
47.2	39.9	P	14.4	V/44	-18.6	35.7	40.0	4.3
74.0	44.5	P	6.9	V/44	-18.2	33.2	40.0	6.8
95.2	40.3	P	8.5	V/44	-18.2	30.6	43.5	12.9
153.2	41.1	P	10.1	V/44	-18.1	33.1	43.5	10.4
200.1	44.0	Q	9.6	V/44	-17.8	35.8	43.5	7.7
214.8	38.3	P	11.1	V/44	-17.8	31.6	43.5	11.9
226.0	36.7	P	11.6	V/44	-17.8	30.5	46.0	15.5
240.0	42.1	P	12.2	V/44	-17.8	36.5	46.0	9.5

Freq. MHz	Meter Reading dBuV	Dect. Type	Antenna		Corr. Factors dB	Field Strength dBuV/m		Margin Under Limit dB
			Factor dB	Pol/ ID#		EUT	Limit	
274.3	35.9	P	13.1	V/44	-17.8	31.2	46.0	14.8
348.8	36.9	P	14.9	V/44	-17.8	34.0	46.0	12.0
360.0	36.5	P	14.8	V/44	-17.8	33.5	46.0	12.5
434.4	39.2	P	16.6	V/44	-17.7	38.1	46.0	7.9
449.6	39.7	P	16.2	V/44	-17.7	38.2	46.0	7.8
450.2	39.1	P	16.2	V/44	-17.7	37.6	46.0	8.4
465.3	36.9	P	17.2	V/44	-17.7	36.4	46.0	9.6
480.0	40.6	P	17.0	V/44	-17.7	39.9	46.0	6.1
627.1	31.4	P	18.7	V/44	-16.8	33.3	46.0	12.7
720.0	37.2	P	19.5	V/44	-16.4	40.3	46.0	5.7
825.4	31.3	P	21.5	V/44	-16.0	36.8	46.0	9.2
858.4	30.7	P	20.8	V/44	-15.9	35.6	46.0	10.4
891.5	34.5	P	21.4	V/44	-15.7	40.2	46.0	5.8
908.0	36.2	P	21.9	V/44	-15.7	42.4	46.0	3.6
924.4	36.4	P	22.0	V/44	-15.6	42.8	46.0	3.2
940.8	33.7	P	22.3	V/44	-15.6	40.4	46.0	5.6
960.1	35.7	Q	22.4	V/44	-15.5	42.6	54.0	11.4
973.6	32.1	P	22.1	V/44	-15.5	38.7	54.0	15.3
990.0	39.0	P	22.6	V/44	-15.4	46.2	54.0	7.8
1023.1	36.7	P	23.4	V/44	-15.3	44.8	54.0	9.2
1056.0	37.6	P	23.6	V/44	-15.2	46.0	54.0	8.0
1200.0	22.5	P	24.5	V/44	-14.7	32.3	54.0	21.7

Judgment: Passed by 3.2 dB