

# NORTHWEST EMC

## Connected Development

Multi-Tech MTPCIEBW (to be incorporated into the Zoll LifeVest 5000)

FCC 15.247:2015

802.11 bgn Radio

Report # CDVE0003.6



NVLAP Lab Code: 201049-0

*This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report may only be duplicated in its entirety*

# CERTIFICATE OF TEST

Last Date of Test: December 15, 2015

Connected Development

Model: Multi-Tech MTPCIEBW (to be incorporated into the Zoll LifeVest 5000)

## Radio Equipment Testing

### Standards

Specification	Method
FCC 15.247:2015	ANSI C63.10:2013

### Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for antenna change only.
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Band Edge Compliance	No	N/A	Not required for antenna change only.
6.7	Spurious Conducted Emissions	No	N/A	Not required for antenna change only.
6.9.1	Occupied Bandwidth	No	N/A	Not required.
6.10.2	Output Power	No	N/A	Not required.
6.11.2	Power Spectral Density	No	N/A	Not required.
7.5	Duty Cycle	No	N/A	Not required for antenna change only.

### Deviations From Test Standards

None

### Approved By:



Jeremiah Darden, Operations Manager

*Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.*

# REVISION HISTORY

Revision Number		Description	Date	Page Number
00		None		

# ACCREDITATIONS AND AUTHORIZATIONS

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## United States

**FCC** - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

**NVLAP** - Each laboratory is accredited by NVLAP to ISO 17025

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## Canada

**IC** - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

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## European Union

**European Commission** – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

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## Australia/New Zealand

**ACMA** - Recognized by ACMA as a CAB for the acceptance of test data.

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## Korea

**MSIP / RRA** - Recognized by KCC's RRA as a CAB for the acceptance of test data.

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## Japan

**VCCI** - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

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## Taiwan

**BSMI** – Recognized by BSMI as a CAB for the acceptance of test data.

**NCC** - Recognized by NCC as a CAB for the acceptance of test data.

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## Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

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## Israel

**MOC** – Recognized by MOC as a CAB for the acceptance of test data.

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## Hong Kong

**OFCA** – Recognized by OFCA as a CAB for the acceptance of test data.

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## Vietnam

**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

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## SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>  
<http://gsi.nist.gov/global/docs/cabs/designations.html>

# MEASUREMENT UNCERTAINTY

## Measurement Uncertainty

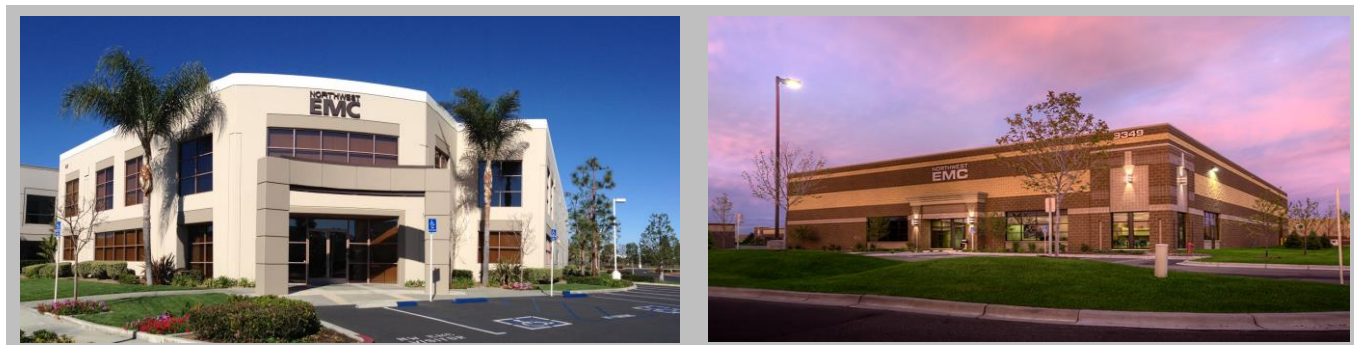
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

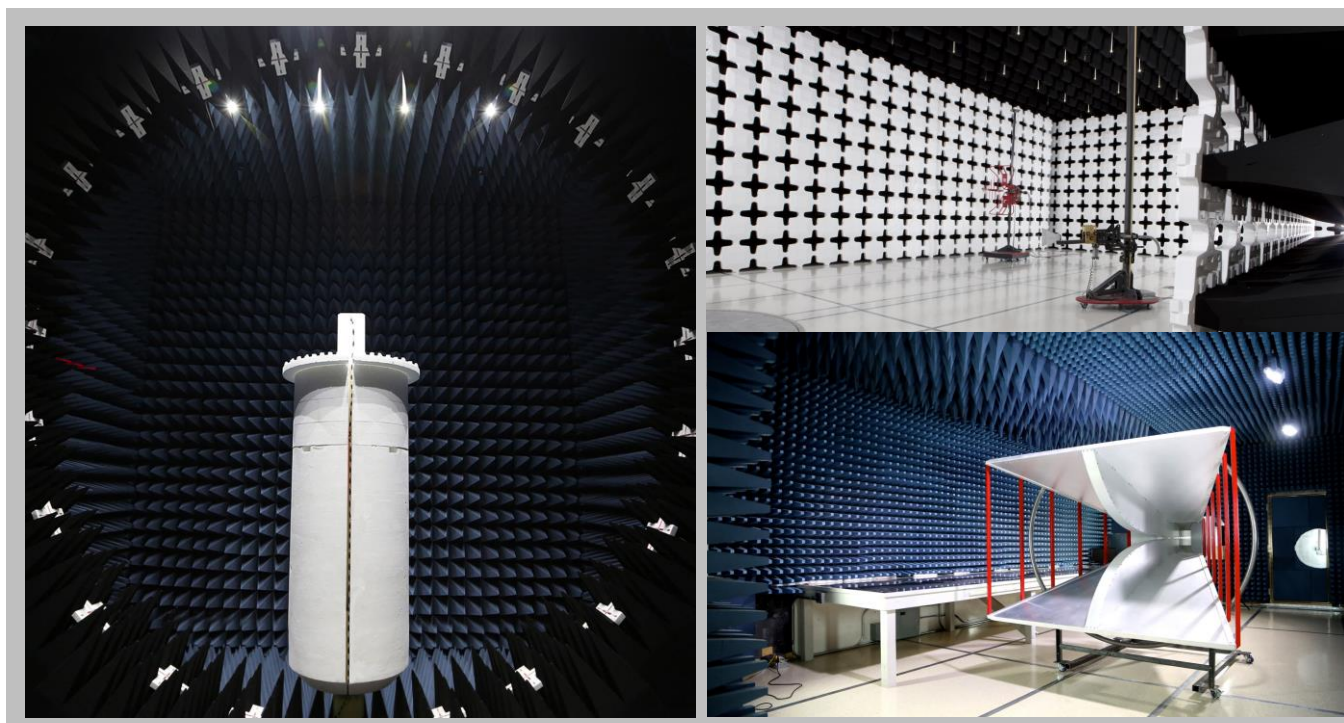
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

<b>Test</b>	<b>+ MU</b>	<b>- MU</b>
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.9 dB	-4.9 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

# FACILITIES



<b>California</b> Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	<b>Minnesota</b> Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	<b>New York</b> Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	<b>Oregon</b> Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	<b>Texas</b> Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	<b>Washington</b> Labs NC01-05 19201 120 <sup>th</sup> Ave NE Bothell, WA 9801 (425)984-6600
<b>NVLAP</b>					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
<b>Industry Canada</b>					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
<b>BSMI</b>					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
<b>VCCI</b>					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
<b>Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA</b>					
US0158	US0175	N/A	US0017	US0191	US0157





# PRODUCT DESCRIPTION

## Client and Equipment Under Test (EUT) Information

<b>Company Name:</b>	Connected Development
<b>Address:</b>	5020 Weston Parkway Suite 215
<b>City, State, Zip:</b>	Cary, NC 27513
<b>Test Requested By:</b>	Mike Thys
<b>Model:</b>	Multi-Tech MTPCIEBW (to be incorporated into the Zoll LifeVest 5000)
<b>First Date of Test:</b>	December 04, 2015
<b>Last Date of Test:</b>	December 15, 2015
<b>Receipt Date of Samples:</b>	December 03, 2015
<b>Equipment Design Stage:</b>	Prototype
<b>Equipment Condition:</b>	No Damage

## Information Provided by the Party Requesting the Test

### Functional Description of the EUT:

The EUT is the Zoll LifeVest 5000 which is a PCIE technology product that uses a Murata Wifi/Bluetooth radio module (Multi-Tech MTPCIEBW) and 2.4GHz Multi Standard Antenna (Taoglas, part number: FXP73.07.0100A).

The LifeVest is the first wearable defibrillator. It is worn outside the body rather than implanted in the chest. This device continuously monitors the patient's heart with dry, non-adhesive sensing electrodes to detect life-threatening abnormal heart rhythms. If a life-threatening rhythm is detected, the device alerts the patient prior to delivering a treatment shock, and thus allows a conscious patient to delay the treatment shock. If the patient becomes unconscious, the device releases a Blue™ gel over the therapy electrodes and delivers an electrical shock to restore normal rhythm.

### Testing Objective:

To demonstrate compliance of the 802.11 radio module with a new antenna under FCC 15.247 for operation in the 2.4 GHz band(s) for a Class II Permissive Change.

# CONFIGURATIONS

## Configuration CDVE0003- 4

Software/Firmware Running during test	
Description	Version
ClearTerminal	V1.00

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Wearable Defibrillator (EUT) -Emissions	Zoll International	LifeVest 5000	93ENGVER_10

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop Computer	Dell	Vostro 3550	J9Y3PP1
AC/DC Adapter (for Laptop)	Targus	APA31US	F146021351032317-0A
AC/DC Adapter (for EUT)	V-Infinity	ETSA120330UD	None
Test circuit board	Connected Development	None	19A0553-A01

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	0.9m	No	AC Mains	AC/DC Adapter (for Laptop)
DC Power	No	1.8m	Yes	AC/DC Adapter (for Laptop)	Laptop Computer
AC Power	No	1.8m	No	AC Mains	AC/DC Adapter (for EUT)
DC Power	No	1.7m	Yes	AC/DC Adapter (for EUT)	Wearable Defibrillator (EUT)
USB to Mini-USB cable	No	1m	No	Laptop Computer	Test Circuit Board
Ribbon Cable	No	0.15m	No	Test Circuit Board	Wearable Defibrillator (EUT)



# MODIFICATIONS

## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	12/4/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	12/15/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## MODES OF OPERATION

Transmitting at Low, Mid, High Channel @ 2412, 2437, 2462 MHz

Transmitting at Low, High Channel @ 2412, 2462 MHz

## POWER SETTINGS INVESTIGATED

12VDC

## CONFIGURATIONS INVESTIGATED

CDVE0003 - 4

## FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 GHz
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## SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10/29/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	10/22/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	10/22/2015	12 mo
Cable	Northwest EMC	8-18GHz	TXD	10/21/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	9/18/2015	12 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	10/21/2015	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJL	9/15/2014	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	9/18/2015	12 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	9/18/2015	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	4/7/2014	24 mo
Attenuator	Fairview Microwave	SA18H-20	TKQ	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHX	8/11/2015	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	8/11/2015	12 mo
Antenna - Double Ridge	A. H. Systems, Inc.	SAS-574	AXW	4/23/2014	24 mo
Cable	Northwest EMC	18-40GHz	TXE	11/20/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	11/20/2015	12 mo

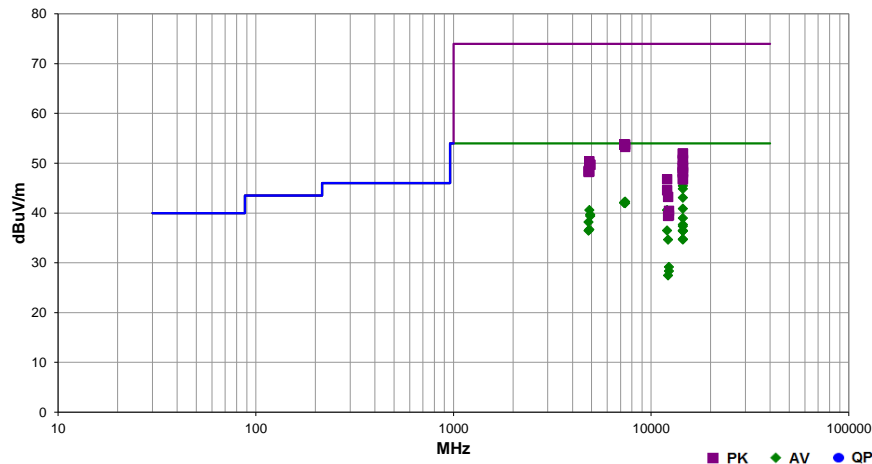
## TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.


Work Order:	CDVE0003	Date:	12/04/15	<i>Jonathan Kiefer</i>
Project:	None	Temperature:	22.8 °C	
Job Site:	TX02	Humidity:	31.2% RH	
Serial Number:	93ENGVER_10	Barometric Pres.:	1035 mbar	
EUT:	Multi-Tech MTPCIEBW (to be incorporated into the Zoll LifeVest 5000)			
Configuration:	4			
Customer:	Connected Development			
Attendees:	None			
EUT Power:	12VDC			
Operating Mode:	Transmitting at Low, Mid, High Channel @ 2412, 2437, 2462 MHz			
Deviations:	None			
Comments:	WiFi mode. See the comments for channel, EUT orientation and data rate information.			

Test Specifications	Test Method
FCC 15.247:2015	ANSI C63.10:2013

Run #	20	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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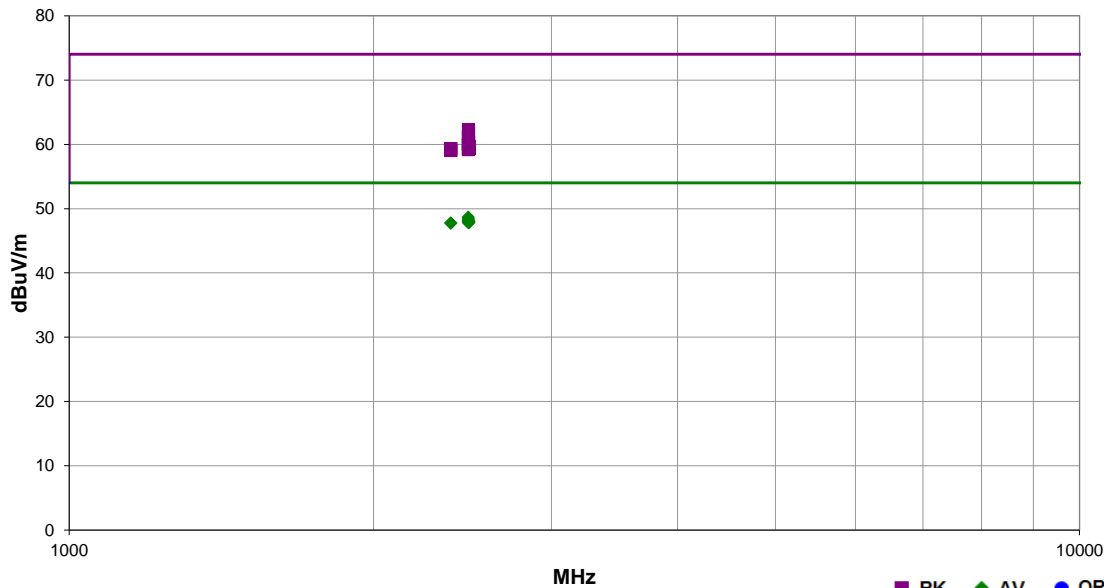


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
14471.820	36.2	9.3	1.4	172.9	3.0	0.0	Vert	AV	0.0	45.5	54.0	-8.5	Low Ch, EUT Vert, 1 Mbps
14471.840	35.6	9.3	3.8	106.9	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Low Ch, EUT On Side, 1 Mbps
14471.830	33.8	9.3	3.0	141.0	3.0	0.0	Horz	AV	0.0	43.1	54.0	-10.9	Low Ch, EUT Vert, 1 Mbps
7387.458	30.5	11.8	1.3	177.0	3.0	0.0	Horz	AV	0.0	42.3	54.0	-11.7	High Ch, EUT On Side, 1 Mbps
7311.175	30.3	11.8	3.1	27.9	3.0	0.0	Horz	AV	0.0	42.1	54.0	-11.9	Mid Ch, EUT On Side, 1 Mbps
7311.675	30.2	11.8	1.3	338.0	3.0	0.0	Vert	AV	0.0	42.0	54.0	-12.0	Mid Ch, EUT Vert, 1 Mbps
7387.292	30.2	11.8	1.3	9.0	3.0	0.0	Vert	AV	0.0	42.0	54.0	-12.0	High Ch, EUT Vert, 1 Mbps
14471.830	31.6	9.3	1.2	176.0	3.0	0.0	Vert	AV	0.0	40.9	54.0	-13.1	Low Ch, EUT Vert, 11 Mbps
4873.875	33.9	6.7	1.3	165.9	3.0	0.0	Vert	AV	0.0	40.6	54.0	-13.4	Mid Ch, EUT Vert, 1 Mbps
12058.830	43.9	-3.3	2.1	160.9	3.0	0.0	Horz	AV	0.0	40.6	54.0	-13.4	Low Ch, EUT On Side, 1 Mbps
4924.067	32.7	7.0	1.3	138.0	3.0	0.0	Vert	AV	0.0	39.7	54.0	-14.3	High Ch, EUT Vert, 1 Mbps
4923.900	32.4	7.0	4.0	297.0	3.0	0.0	Horz	AV	0.0	39.4	54.0	-14.6	High Ch, EUT On Side, 1 Mbps
14471.750	29.7	9.3	1.3	303.9	3.0	0.0	Vert	AV	0.0	39.0	54.0	-15.0	Low Ch, EUT On Side, 1 Mbps
4823.858	31.8	6.4	2.1	147.9	3.0	0.0	Vert	AV	0.0	38.2	54.0	-15.8	Low Ch, EUT Vert, 1 Mbps
14471.850	28.4	9.3	1.3	178.9	3.0	0.0	Vert	AV	0.0	37.7	54.0	-16.3	Low Ch, EUT Vert, 6 Mbps
14471.930	28.1	9.3	1.3	177.0	3.0	0.0	Vert	AV	0.0	37.4	54.0	-16.6	Low Ch, EUT Vert, 36 Mbps
4872.142	30.0	6.7	2.8	36.0	3.0	0.0	Horz	AV	0.0	36.7	54.0	-17.3	Mid Ch, EUT On Side, 1 Mbps
12058.880	39.8	-3.3	1.7	229.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Low Ch, EUT Vert, 1 Mbps
14474.400	27.2	9.3	1.3	330.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Low Ch, EUT Vert, MCS7
14471.700	27.2	9.3	1.3	268.9	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Low Ch, EUT Vert, 54 Mbps
4821.792	30.1	6.4	3.8	171.9	3.0	0.0	Horz	AV	0.0	36.5	54.0	-17.5	Low Ch, EUT On Side, 1 Mbps
14470.670	27.1	9.3	1.3	52.9	3.0	0.0	Vert	AV	0.0	36.4	54.0	-17.6	Low Ch, EUT Vert, MCS0
14472.630	25.5	9.3	1.3	289.0	3.0	0.0	Vert	AV	0.0	34.8	54.0	-19.2	Low Ch, EUT Horz, 1 Mbps
14473.050	25.4	9.3	1.3	39.9	3.0	0.0	Horz	AV	0.0	34.7	54.0	-19.3	Low Ch, EUT Horz, 1 Mbps
12183.860	38.2	-3.6	1.6	237.9	3.0	0.0	Vert	AV	0.0	34.6	54.0	-19.4	Mid Ch, EUT Vert, 1 Mbps
7309.292	42.0	11.8	1.3	338.0	3.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Mid Ch, EUT Vert, 1 Mbps
7385.900	42.0	11.8	1.3	177.0	3.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	High Ch, EUT On Side, 1 Mbps
7312.742	41.9	11.8	3.1	27.9	3.0	0.0	Horz	PK	0.0	53.7	74.0	-20.3	Mid Ch, EUT On Side, 1 Mbps
7385.125	41.5	11.8	1.3	9.0	3.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	High Ch, EUT Vert, 1 Mbps
14471.850	42.7	9.3	1.4	172.9	3.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	Low Ch, EUT Vert, 1 Mbps
14471.660	42.7	9.3	3.8	106.9	3.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Low Ch, EUT On Side, 1 Mbps
14471.720	41.5	9.3	1.2	176.0	3.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	Low Ch, EUT Vert, 11 Mbps
14471.560	41.3	9.3	3.0	141.0	3.0	0.0	Horz	PK	0.0	50.6	74.0	-23.4	Low Ch, EUT Vert, 1 Mbps
4874.025	43.7	6.7	1.3	165.9	3.0	0.0	Vert	PK	0.0	50.4	74.0	-23.6	Mid Ch, EUT Vert, 1 Mbps
4924.108	42.7	7.0	4.0	297.0	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	High Ch, EUT On Side, 1 Mbps
4923.725	42.7	7.0	1.3	138.0	3.0	0.0	Vert	PK	0.0	49.7	74.0	-24.3	High Ch, EUT Vert, 1 Mbps
14472.140	40.2	9.3	1.3	177.0	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	Low Ch, EUT Vert, 36 Mbps
12311.330	32.2	-3.1	1.3	237.9	3.0	0.0	Vert	AV	0.0	29.1	54.0	-24.9	High Ch, EUT Vert, 1 Mbps
14471.680	39.8	9.3	1.3	178.9	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	Low Ch, EUT Vert, 6 Mbps
14471.240	39.8	9.3	1.3	303.9	3.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	Low Ch, EUT On Side, 1 Mbps
4822.358	42.1	6.4	3.8	171.9	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch, EUT On Side, 1 Mbps
4871.825	41.7	6.7	2.8	36.0	3.0	0.0	Horz	PK	0.0	48.4	74.0	-25.6	Mid Ch, EUT On Side, 1 Mbps
14470.810	39.1	9.3	1.3	268.9	3.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	Low Ch, EUT Vert, 54 Mbps
12310.780	31.4	-3.1	1.3	237.0	3.0	0.0	Horz	AV	0.0	28.3	54.0	-25.7	High Ch, EUT On Side, 1 Mbps
4822.050	41.9	6.4	2.1	147.9	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low Ch, EUT Vert, 1 Mbps
14472.380	39.0	9.3	1.3	330.0	3.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low Ch, EUT Vert, MCS7
14474.480	38.8	9.3	1.3	52.9	3.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	Low Ch, EUT Vert, MCS0
12186.100	31.0	-3.6	1.3	297.9	3.0	0.0	Horz	AV	0.0	27.4	54.0	-26.6	Mid Ch, EUT On Side, 1 Mbps
14473.290	37.6	9.3	1.3	289.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch, EUT Horz, 1 Mbps
12059.580	50.1	-3.3	2.1	160.9	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Low Ch, EUT On Side, 1 Mbps
14469.730	37.5	9.3	1.3	39.9	3.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Low Ch, EUT Horz, 1 Mbps
12058.440	47.9	-3.3	1.7	229.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	Low Ch, EUT Vert, 1 Mbps
12184.870	46.8	-3.6	1.6	237.9	3.0	0.0	Vert	PK	0.0	43.2	74.0	-30.8	Mid Ch, EUT Vert, 1 Mbps
12309.440	43.5	-3.1	1.3	237.9	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	High Ch, EUT Vert, 1 Mbps
12307.520	42.6	-3.1	1.3	237.0	3.0	0.0	Horz	PK	0.0	39.5	74.0	-34.5	High Ch, EUT On Side, 1 Mbps
12182.570	43.0	-3.6	1.3	297.9	3.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	Mid Ch, EUT On Side, 1 Mbps

Work Order:	CDVE0003	Date:	12/15/15		
Project:	None	Temperature:	23.6 °C		
Job Site:	TX02	Humidity:	38% RH		
Serial Number:	93ENGVER_10	Barometric Pres.:	1010 mbar		
				Tested by:	Jonathan Kiefer
EUT:	Multi-Tech MTPCIEBW (to be incorporated into the Zoll LifeVest 5000)				
Configuration:	4				
Customer:	Connected Development				
Attendees:	None				
EUT Power:	12VDC				
Operating Mode:	Transmitting at Low, High Channel @ 2412, 2462 MHz.				
Deviations:	None				
Comments:	WiFi mode. Transmit Band Edge. 20 dB external attenuation. See the comments for channel, EUT orientation and data rate information.				

Test Specifications	Test Method
FCC 15.247:2015	ANSI C63.10:2013

Run #	101	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.620	33.5	-4.8	1.3	128.0	3.0	20.0	Vert	AV	0.0	48.7	54.0	-5.3	High Ch, EUT Vert, MCS0
2483.853	33.2	-4.8	1.3	123.9	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch, EUT Vert, 6 Mbps
2483.507	33.0	-4.8	1.3	307.0	3.0	20.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch, EUT Horz, 6 Mbps
2483.573	32.9	-4.8	1.3	163.0	3.0	20.0	Horz	AV	0.0	48.1	54.0	-5.9	High Ch, EUT On Side, 6 Mbps
2487.007	32.8	-4.8	1.3	186.0	3.0	20.0	Vert	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Vert, 1 Mbps
2483.673	32.8	-4.8	2.6	241.0	3.0	20.0	Horz	AV	0.0	48.0	54.0	-6.0	High Ch, EUT Horz, 6 Mbps
2487.333	32.7	-4.8	1.3	337.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vert, 11 Mbps
2485.660	32.7	-4.8	1.3	331.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vert, 6 Mbps
2485.233	32.7	-4.8	1.3	110.0	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch, EUT On Side, 6 Mbps
2484.320	32.7	-4.8	1.3	220.9	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vert, 36 Mbps
2484.080	32.7	-4.8	3.7	321.9	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vert, 54 Mbps
2485.153	32.6	-4.8	1.3	48.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	High Ch, EUT Vert, MCS7
2386.627	32.7	-4.9	2.8	321.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Low Ch, EUT Vert, 1 Mbps
2386.233	32.7	-4.9	1.3	247.0	3.0	20.0	Vert	AV	0.0	47.8	54.0	-6.2	Low Ch, EUT Vert, 6 Mbps
2483.933	47.1	-4.8	1.3	123.9	3.0	20.0	Vert	PK	0.0	62.3	74.0	-11.7	High Ch, EUT Vert, 6 Mbps
2484.067	46.7	-4.8	1.3	128.0	3.0	20.0	Vert	PK	0.0	61.9	74.0	-12.1	High Ch, EUT Vert, MCS0
2483.740	46.0	-4.8	1.3	307.0	3.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	High Ch, EUT Horz, 6 Mbps
2485.287	45.1	-4.8	1.3	337.0	3.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7	High Ch, EUT Vert, 11 Mbps
2484.133	44.9	-4.8	1.3	163.0	3.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	High Ch, EUT On Side, 6 Mbps
2483.653	44.8	-4.8	2.6	241.0	3.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	High Ch, EUT Horz, 6 Mbps
2483.973	44.7	-4.8	1.3	110.0	3.0	20.0	Vert	PK	0.0	59.9	74.0	-14.1	High Ch, EUT On Side, 6 Mbps
2486.980	44.5	-4.8	1.3	48.0	3.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch, EUT Vert, MCS7
2484.813	44.3	-4.8	1.3	186.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch, EUT Vert, 1 Mbps
2487.147	44.2	-4.8	1.3	331.0	3.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	High Ch, EUT Vert, 6 Mbps
2387.147	44.3	-4.9	1.3	247.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch, EUT Vert, 1 Mbps
2484.013	44.1	-4.8	1.3	220.9	3.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch, EUT Vert, 36 Mbps
2483.640	44.0	-4.8	3.7	321.9	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch, EUT Vert, 54 Mbps
2386.373	44.0	-4.9	2.8	321.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch, EUT Vert, 1 Mbps