ZOLL Medical Corporation

Zoll CF Card Module

FCC 15.407:2013

Report #: LGPD0094.4

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: July 14, 2013
ZOLL Medical Corporation
Model: Zoll CF Card Module

Emissions

Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.407:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200676-0

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
41 Tesla Ave.
Irvine, CA 92618

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834B-1).

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.

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. This Report may only be duplicated in its entirety. 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.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

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 Guide 65 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

Canada

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

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.

Australia/New Zealand

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

Korea

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

Japan

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

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.

Singapore

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

Hong Kong

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

Vietnam

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

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

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 listed below. 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 16-4-1 as applicable), and are available upon request.

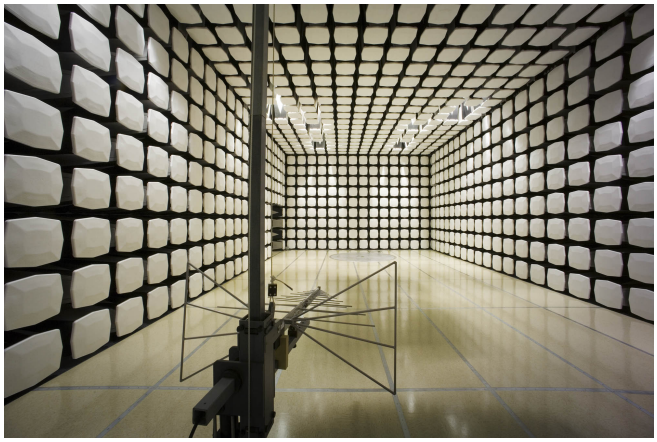
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

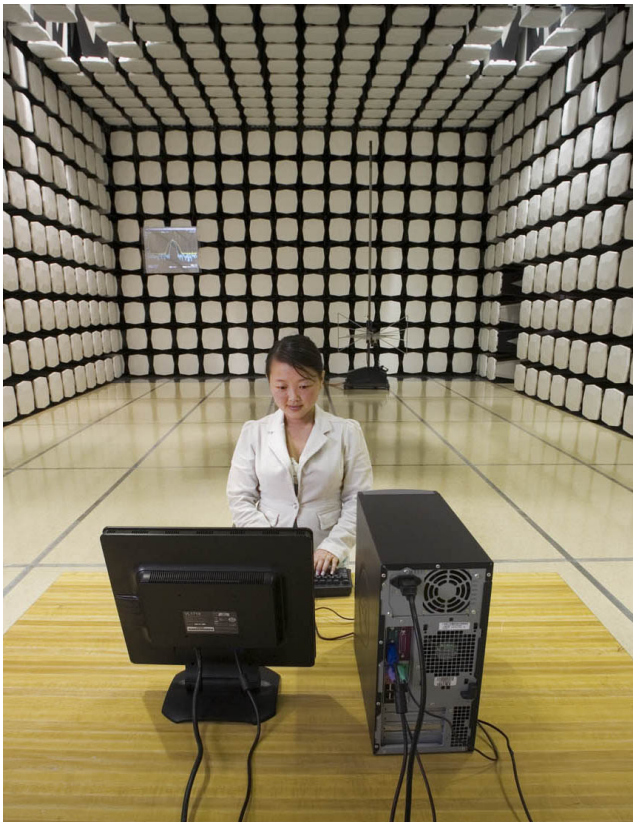
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94

LOCATIONS

REV 2013.02.26

Oregon	California	New York	Minnesota	Washington
Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0





PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	ZOLL Medical Corporation
Address:	269 Mill Road
City, State, Zip:	Chelmsford, MA 01824
Test Requested By:	Curt McNamara – Logic Product Development
Model:	Z-RS-DC002
First Date of Test:	May 03, 2013
Last Date of Test:	July 14, 2013
Receipt Date of Samples:	April 29, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
802.11abgn CF wireless card containing 1x1 SISO radio module operating in 20 MHz channel bandwidth that is normally installed in the ZOLL R Series™ defibrillators.

Testing Objective:
To demonstrate compliance to the radiated emissions requirements of FCC 15.407. Compliance to the remaining requirements of FCC 15.407 is documented in other test reports.

CONFIGURATIONS

Configuration LGPD0094- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zoll CF Card Module	Zoll Medical Corporation	Z-RS-DC002	SN0024
Defibrillator	Zoll Medical Corporation	None	AF13A026560

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
MFC Cable	No	3.7m	No	Defibrillator	Terminated
AC Cable	No	4.0m	No	Defibrillator	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration LGPD0094- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zoll CF Card Module	Zoll Medical Corporation	Z-RS-DC002	SN0024

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell Technologies Inc.	PP18L	33583998997

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Serial Cable	No	1.8m	No	Laptop	Zoll CF Card Module
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration LGPD0108- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Zoll CF Card Module	Zoll Medical Corporation	Z-RS-DC002	SN0024
Defibrillator	Zoll Medical Corporation	None	AF13A026560

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
MFC Cable	No	3.7m	No	Defibrillator	Terminated
AC Cable	No	4.0m	No	Defibrillator	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/3/2013	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	5/17/2013	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
3	7/14/2013	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS

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 802.11(a), Channel 36
Transmitting at 802.11(a), Channel 48
Transmitting at 802.11(a), Channel 52
Transmitting at 802.11(a), Channel 64
Transmitting at 802.11(a), Channel 100
Transmitting at 802.11(a), Channel 116
Transmitting at 802.11(a), Channel 140

DATA RATES INVESTIGATED

6, 36, 54, MCS0, MCS7

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

LGPD0108-1
LGPD0094-1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40 GHz

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
5.15-5.35 Notch Filter	Micro-Tronics	BRC50703	HGH	7/26/2012	24 mo
BP Filter	Micro-Tronics	BRC50704	HGB	7/26/2012	36 mo
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	PAE	1/29/2013	12 mo
Antenna, Horn	ETS	3160-10	AIX	NCR	0 mo
Cable	ESM Cable Corp.	KMKM-72	OC1	1/29/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	4/29/2013	12 mo
Antenna, Horn	EMCO	3160-09	AHN	NCR	0 mo
OC floating Cable	N/A	18-26GHz RE Cables	OCK	4/29/2013	12 mo
OC07 Cables	ESM Cable Corp.	8-18GHz cables	OCY	3/7/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	1/18/2013	12 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	0 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	1/18/2013	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIR	5/26/2011	36 mo
OC07 Cables	ESM Cable Corp.	30-1GHz cables	OCW	3/7/2013	12 mo
Pre-Amplifier	Miteq	AM-1402	AOZ	2/19/2013	12 mo
Antenna, Biconilog	EMCO	3142	AXA	1/11/2013	12 mo
Spectrum Analyzer	Agilent	E4440A	AFG	5/16/2012	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407.

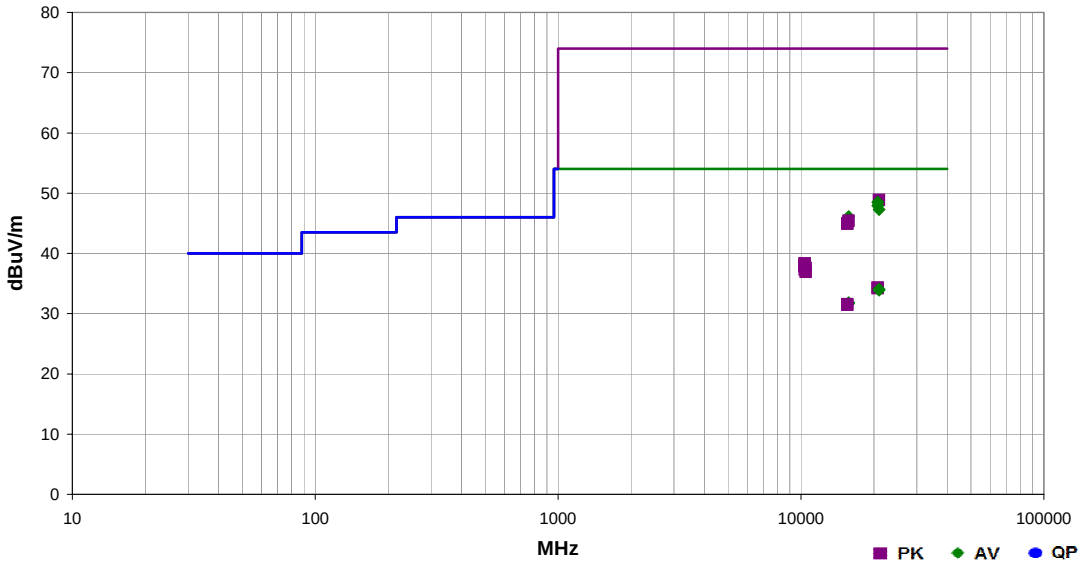
While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	LGPD0094	**Date:**	05/03/13		
Project:	None	**Temperature:**	26 °C		
Job Site:	OC10	**Humidity:**	25.4% RH		
Serial Number:	SN0024	**Barometric Pres.:**	1011 mbar	**Tested by:**	Mark Baytan
EUT:	Zoll CF Card Module				
Configuration:	1				
Customer:	Logic Product Development				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Operating 802.11a Transmit: Low Channel 36 - 5180 MHz, High Channel 48 - 5240 MHz; 6 Mbps, 36 Mbps, 54 Mbps.				
Deviations:	None				
Comments:	Using Hyperterminal to program the CF Card. CF Card is powered up by the Defibrillator.				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	42	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



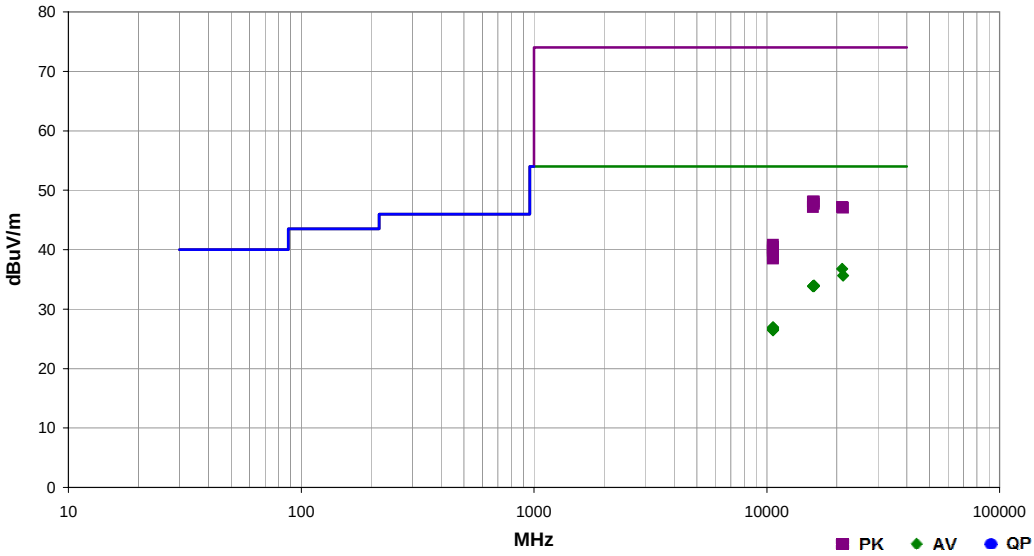
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
20718.030	31.9	2.4	1.0	169.0	3.0	0.0	Vert	AV	0.0	34.3	54.0	-19.7	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
20719.780	31.8	2.4	1.0	18.0	3.0	0.0	Horz	AV	0.0	34.2	54.0	-19.8	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
20959.630	31.5	2.6	1.0	227.0	3.0	0.0	Horz	AV	0.0	34.1	54.0	-19.9	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
20959.730	31.3	2.6	1.0	45.0	3.0	0.0	Vert	AV	0.0	33.9	54.0	-20.1	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15721.910	25.0	6.8	1.5	202.0	3.0	0.0	Vert	AV	0.0	31.8	54.0	-22.2	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15721.410	24.9	6.8	1.0	178.0	3.0	0.0	Horz	AV	0.0	31.7	54.0	-22.3	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15541.780	25.1	6.5	1.0	182.0	3.0	0.0	Vert	AV	0.0	31.6	54.0	-22.4	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
15540.370	25.0	6.5	1.0	359.0	3.0	0.0	Horz	AV	0.0	31.5	54.0	-22.5	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
20960.290	46.3	2.6	1.0	227.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
20720.490	46.1	2.4	1.0	18.0	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
20720.380	45.5	2.4	1.0	169.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
20959.500	44.7	2.6	1.0	45.0	3.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15718.510	39.3	6.8	1.5	202.0	3.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15721.110	38.6	6.8	1.0	178.0	3.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
15541.920	38.5	6.5	1.0	359.0	3.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
15540.950	38.5	6.5	1.0	182.0	3.0	0.0	Vert	PK	0.0	45.0	74.0	-29.0	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
10359.430	47.6	-9.3	1.0	321.0	3.0	0.0	Horz	PK	0.0	38.3	74.0	-35.7	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
10360.860	47.6	-9.3	1.0	244.0	3.0	0.0	Vert	PK	0.0	38.3	74.0	-35.7	Low Ch 36, 5180 MHz, 6 Mbps, X-Axis
10360.200	47.3	-9.3	1.0	173.0	3.0	0.0	Horz	PK	0.0	38.0	74.0	-36.0	Low Ch 36, 5180 MHz, 36 Mbps, X-Axis
10358.650	47.2	-9.3	1.0	28.0	3.0	0.0	Vert	PK	0.0	37.9	74.0	-36.1	Low Ch 36, 5180 MHz, 54 Mbps, X-Axis
10360.830	47.2	-9.3	1.0	200.0	3.0	0.0	Horz	PK	0.0	37.9	74.0	-36.1	Low Ch 36, 5180 MHz, 54 Mbps, X-Axis
10478.820	46.9	-9.4	1.0	304.0	3.0	0.0	Vert	PK	0.0	37.5	74.0	-36.5	High Ch 48, 5240 MHz, 6 Mbps, X-Axis
10359.820	46.6	-9.3	1.0	28.0	3.0	0.0	Vert	PK	0.0	37.3	74.0	-36.7	Low Ch 36, 5180 MHz, 36 Mbps, X-Axis
10478.750	46.3	-9.4	1.0	269.0	3.0	0.0	Horz	PK	0.0	36.9	74.0	-37.1	High Ch 48, 5240 MHz, 6 Mbps, X-Axis

SPURIOUS RADIATED EMISSIONS

Work Order:	LGPD0108	**Date:**	07/11/13		
Project:	None	**Temperature:**	24.5 °C		
Job Site:	OC07	**Humidity:**	45.5% RH		
Serial Number:	SN0024	**Barometric Pres.:**	1012 mbar	**Tested by:**	Jaemi Suh
EUT:	Zoll CF Card Module				
Configuration:	1				
Customer:	Logic Product Development				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 802.11(a), Channel 52 & 64, Data Rates: 6, 36 54, MCS0, MCS7.				
Deviations:	None				
Comments:	Using Hyperterminal to program the CF Card. CF Card is powered up by the Defibrillator.				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	22	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



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
21039.740	34.4	2.4	1.2	75.0	3.0	0.0	Vert	AV	0.0	36.8	54.0	-17.2	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
21280.370	34.2	1.4	1.2	5.0	3.0	0.0	Vert	AV	0.0	35.6	54.0	-18.4	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
15960.110	26.0	8.0	1.0	274.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
15780.670	40.7	7.4	1.0	264.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
15960.040	40.1	8.0	1.0	274.0	3.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
15778.660	26.5	7.4	1.0	264.0	3.0	0.0	Horz	AV	0.0	33.9	54.0	-20.1	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
15959.330	25.9	8.0	1.0	122.0	3.0	0.0	Horz	AV	0.0	33.9	54.0	-20.1	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
15777.750	26.5	7.4	1.0	203.0	3.0	0.0	Horz	AV	0.0	33.9	54.0	-20.1	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
15960.590	39.7	8.0	1.0	122.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
15779.390	39.8	7.4	1.0	203.0	3.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
21039.740	44.8	2.4	1.2	75.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Low Ch.52, 5280 MHz, 36 Mbps, X-Axis
21279.800	45.6	1.4	1.2	5.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
10639.960	36.2	-9.3	1.0	191.0	3.0	0.0	Horz	AV	0.0	26.9	54.0	-27.1	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
10639.930	36.2	-9.3	1.0	191.0	3.0	0.0	Horz	AV	0.0	26.9	54.0	-27.1	High Ch.64, 5320 MHz, 54 Mbps, X-Axis
10640.030	36.1	-9.3	1.0	191.0	3.0	0.0	Horz	AV	0.0	26.8	54.0	-27.2	High Ch.64, 5320 MHz, MCS0, X-Axis
10639.930	36.1	-9.3	1.0	191.0	3.0	0.0	Horz	AV	0.0	26.8	54.0	-27.2	High Ch.64, 5320 MHz, MCS7, X-Axis
10639.950	36.0	-9.3	1.0	137.0	3.0	0.0	Horz	AV	0.0	26.7	54.0	-27.3	High Ch.64, 5320 MHz, 6 Mbps, X-Axis
10639.940	36.0	-9.3	1.0	330.0	3.0	0.0	Vert	AV	0.0	26.7	54.0	-27.3	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
10640.000	35.9	-9.3	1.0	229.0	3.0	0.0	Horz	AV	0.0	26.6	54.0	-27.4	High Ch.64, 5320 MHz, 6 Mbps, X-Axis
10640.230	50.1	-9.3	1.0	330.0	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
10640.180	35.9	-9.3	1.0	99.0	3.0	0.0	Vert	AV	0.0	26.6	54.0	-27.4	High Ch.64, 5320 MHz, 6 Mbps, Y-Axis
10638.770	35.8	-9.3	1.9	53.0	3.0	0.0	Vert	AV	0.0	26.5	54.0	-27.5	High Ch.64, 5320 MHz, 6 Mbps, Y-Axis
10640.020	35.8	-9.3	1.0	37.0	3.0	0.0	Vert	AV	0.0	26.5	54.0	-27.5	High Ch.64, 5320 MHz, 6 Mbps, Z-Axis
10639.940	35.7	-9.3	2.4	97.0	3.0	0.0	Horz	AV	0.0	26.4	54.0	-27.6	High Ch.64, 5320 MHz, 6 Mbps, Z-Axis
10639.070	49.7	-9.3	1.9	53.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	High Ch.64, 5320 MHz, 6 Mbps, Y-Axis
10639.650	49.7	-9.3	1.0	137.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	High Ch.64, 5320 MHz, 6 Mbps, Y-Axis
10638.740	49.5	-9.3	2.4	97.0	3.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	High Ch.64, 5320 MHz, 6 Mbps, Z-Axis
10641.530	49.5	-9.3	1.0	191.0	3.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	High Ch.64, 5320 MHz, 36 Mbps, X-Axis
10640.190	49.1	-9.3	1.0	37.0	3.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	High Ch.64, 5320 MHz, 6 Mbps, Z-Axis
10640.280	49.1	-9.3	1.0	99.0	3.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	High Ch.64, 5320 MHz, 6 Mbps, X-Axis
10641.750	49.1	-9.3	1.0	229.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	High Ch.64, 5320 MHz, 6 Mbps, X-Axis
10640.060	48.3	-9.3	1.0	191.0	3.0	0.0	Horz	PK	0.0	39.0	74.0	-35.0	High Ch.64, 5320 MHz, MCS0, X-Axis
10640.820	47.9	-9.3	1.0	191.0	3.0	0.0	Horz	PK	0.0	38.6	74.0	-35.4	High Ch.64, 5320 MHz, MCS7, X-Axis
10640.560	47.8	-9.3	1.0	191.0	3.0	0.0	Horz	PK	0.0	38.5	74.0	-35.5	High Ch.64, 5320 MHz, 54 Mbps, X-Axis

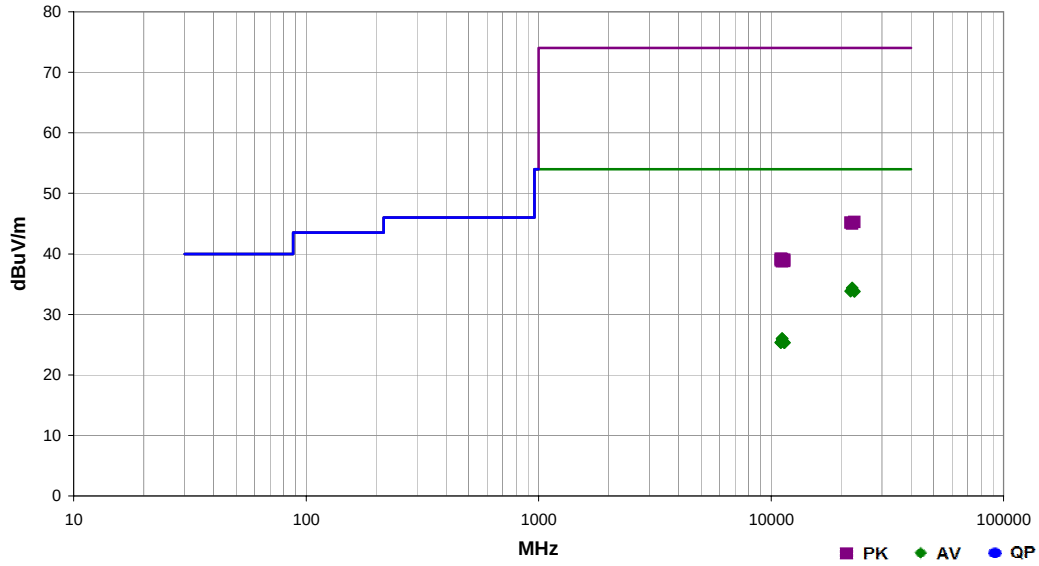
SPURIOUS RADIATED EMISSIONS

Work Order:	LGPD0108	**Date:**	07/11/13		
Project:	None	**Temperature:**	24.5 °C		
Job Site:	OC07	**Humidity:**	45.5% RH		
Serial Number:	SN0024	**Barometric Pres.:**	1012 mbar	**Tested by:**	Jaemi Suh

EUT:	Zoll CF Card Module
Configuration:	1
Customer:	Logic Product Development
Attendees:	None
EUT Power:	110VAC/60Hz
Operating Mode:	Transmitting at 802.11(a), Channel 100, 116, 140, Data Rates: 6, 36, 54, MCS0, MCS7.
Deviations:	None
Comments:	Using Hyperterminal to program the CF Card. CF Card is powered up by the Defibrillator.

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	21	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



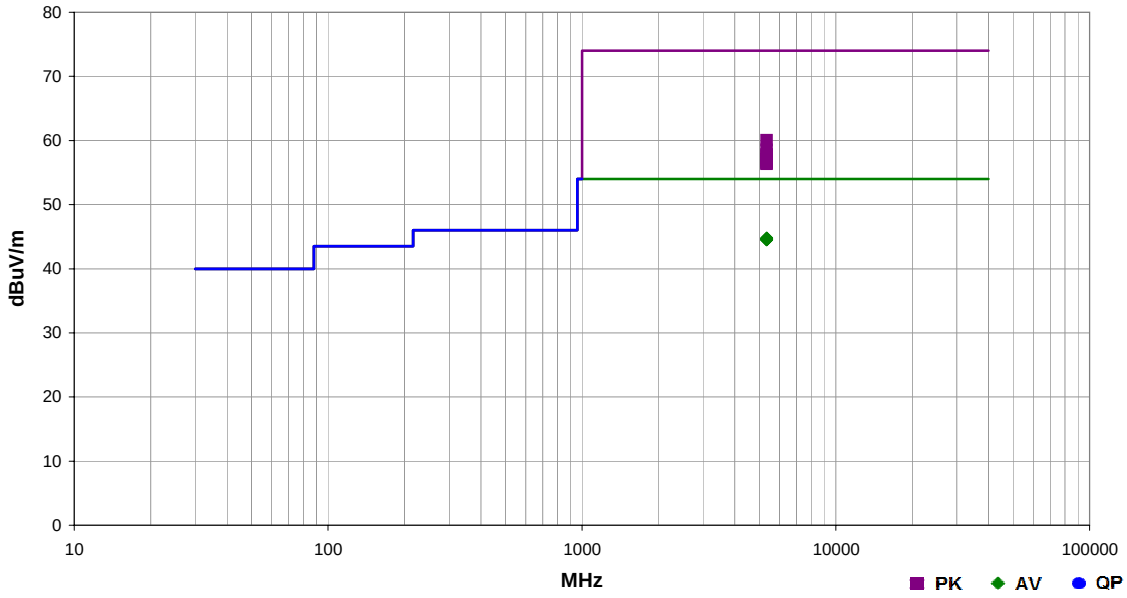
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
22320.150	33.0	1.4	1.2	337.0	3.0	0.0	Vert	AV	0.0	34.4	54.0	-19.6	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
22799.690	32.8	1.0	1.2	225.0	3.0	0.0	Vert	AV	0.0	33.8	54.0	-20.2	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
22799.730	44.3	1.0	1.2	225.0	3.0	0.0	Vert	PK	0.0	45.3	74.0	-28.7	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
22000.880	44.4	0.7	1.2	353.0	3.0	0.0	Vert	PK	0.0	45.1	74.0	-28.9	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis
22319.940	43.6	1.4	1.2	337.0	3.0	0.0	Vert	PK	0.0	45.0	74.0	-29.0	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
11162.000	35.8	-9.8	2.8	245.0	3.0	0.0	Horz	AV	0.0	26.0	54.0	-28.0	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
11161.930	35.7	-9.8	2.3	175.0	3.0	0.0	Vert	AV	0.0	25.9	54.0	-28.1	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
11001.970	35.0	-9.6	1.0	355.0	3.0	0.0	Horz	AV	0.0	25.4	54.0	-28.6	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis
11001.980	34.9	-9.6	1.0	278.0	3.0	0.0	Vert	AV	0.0	25.3	54.0	-28.7	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis
11400.010	34.5	-9.2	3.2	218.0	3.0	0.0	Horz	AV	0.0	25.3	54.0	-28.7	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
11399.850	34.5	-9.2	1.2	35.0	3.0	0.0	Vert	AV	0.0	25.3	54.0	-28.7	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
11000.790	48.8	-9.6	1.0	355.0	3.0	0.0	Horz	PK	0.0	39.2	74.0	-34.8	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis
11159.410	48.9	-9.8	2.3	175.0	3.0	0.0	Vert	PK	0.0	39.1	74.0	-34.9	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
11400.450	48.2	-9.2	1.2	35.0	3.0	0.0	Vert	PK	0.0	39.0	74.0	-35.0	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
11000.280	48.5	-9.6	1.0	278.0	3.0	0.0	Vert	PK	0.0	38.9	74.0	-35.1	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis
11400.190	48.0	-9.2	2.9	218.0	3.0	0.0	Horz	PK	0.0	38.8	74.0	-35.2	High Ch.140, 5700 MHz, 36 Mbps, X-Axis
11160.400	48.5	-9.8	2.7	245.0	3.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	Mid Ch.116, 5580 MHz, 36 Mbps, X-Axis
22001.160	33.1	0.7	1.2	353.0	3.0	0.0	Vert	AV	0.0	33.8	74.0	-40.2	Low Ch.100, 5500 MHz, 36 Mbps, X-Axis

SPURIOUS RADIATED EMISSIONS

Work Order:	LGPD0108	**Date:**	07/14/13		
Project:	None	**Temperature:**	27.1 °C		
Job Site:	OC07	**Humidity:**	39.1% RH		
Serial Number:	SN0024	**Barometric Pres.:**	1011 mbar	**Tested by:**	Mark Baytan
EUT:	Zoll CF Card Module				
Configuration:	1				
Customer:	Logic Product Development				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 802.11(a), Channel 64				
Deviations:	None				
Comments:	Using Hyperterminal to program the CF Card. CF Card is powered up by the Defibrillator.				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	34	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



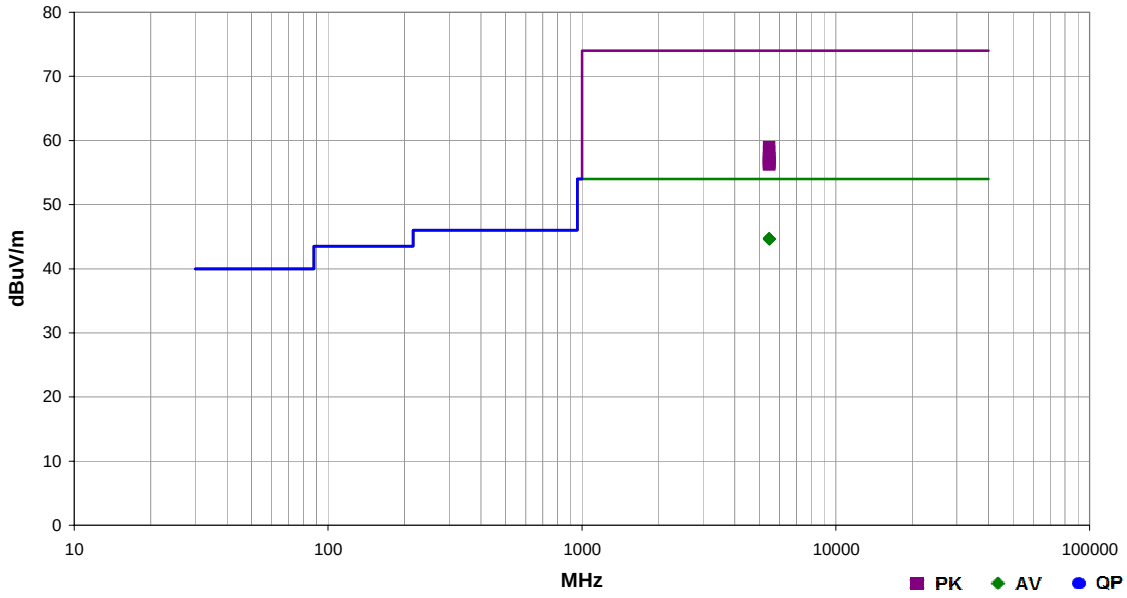
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5350.000	34.2	35.4	1.3	333.0	1.0	0.0	Horz	PK	-9.5	60.0	74.0	-14.0	Ch 64, 5320 MHz, 6 Mbps, X-Axis
5350.000	32.7	35.4	1.3	357.0	1.0	0.0	Vert	PK	-9.5	58.5	74.0	-15.5	Ch 64, 5320 MHz, 6 Mbps, X-Axis
5350.000	32.0	35.4	1.3	324.0	1.0	0.0	Horz	PK	-9.5	57.8	74.0	-16.2	Ch 64, 5320 MHz, MCS7, X-Axis
5350.000	31.8	35.4	1.3	360.0	1.0	0.0	Vert	PK	-9.5	57.6	74.0	-16.4	Ch 64, 5320 MHz, 54 Mbps, X-Axis
5350.000	31.2	35.4	1.3	324.0	1.0	0.0	Horz	PK	-9.5	57.0	74.0	-17.0	Ch 64, 5320 MHz, 54 Mbps, X-Axis
5350.000	31.2	35.4	1.3	324.0	1.0	0.0	Horz	PK	-9.5	57.0	74.0	-17.0	Ch 64, 5320 MHz, MCS0, X-Axis
5350.000	30.9	35.4	1.3	324.0	1.0	0.0	Horz	PK	-9.5	56.7	74.0	-17.3	Ch 64, 5320 MHz, 36 Mbps, X-Axis
5350.000	30.7	35.4	1.3	360.0	1.0	0.0	Vert	PK	-9.5	56.5	74.0	-17.5	Ch 64, 5320 MHz, MCS0, X-Axis
5350.000	30.6	35.4	1.3	360.0	1.0	0.0	Vert	PK	-9.5	56.4	74.0	-17.6	Ch 64, 5320 MHz, MCS7, X-Axis
5350.000	30.5	35.4	1.3	360.0	1.0	0.0	Vert	PK	-9.5	56.3	74.0	-17.7	Ch 64, 5320 MHz, 36 Mbps, X-Axis
5350.000	19.0	35.4	1.3	324.0	1.0	0.0	Horz	AV	-9.5	44.8	74.0	-29.2	Ch 64, 5320 MHz, 36 Mbps, X-Axis
5350.000	18.9	35.4	1.3	333.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 64, 5320 MHz, 6 Mbps, X-Axis
5350.000	18.9	35.4	1.3	324.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 64, 5320 MHz, 54 Mbps, X-Axis
5350.000	18.9	35.4	1.3	324.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 64, 5320 MHz, MCS0, X-Axis
5350.000	18.9	35.4	1.3	324.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 64, 5320 MHz, MCS7, X-Axis
5350.000	18.7	35.4	1.3	357.0	1.0	0.0	Vert	AV	-9.5	44.5	74.0	-29.5	Ch 64, 5320 MHz, 6 Mbps, X-Axis
5350.000	18.7	35.4	1.3	360.0	1.0	0.0	Vert	AV	-9.5	44.5	74.0	-29.5	Ch 64, 5320 MHz, 36 Mbps, X-Axis
5350.000	18.7	35.4	1.3	360.0	1.0	0.0	Vert	AV	-9.5	44.5	74.0	-29.5	Ch 64, 5320 MHz, 54 Mbps, X-Axis
5350.000	18.7	35.4	1.3	360.0	1.0	0.0	Vert	AV	-9.5	44.5	74.0	-29.5	Ch 64, 5320 MHz, MCS0, X-Axis
5350.000	18.7	35.4	1.3	360.0	1.0	0.0	Vert	AV	-9.5	44.5	74.0	-29.5	Ch 64, 5320 MHz, MCS7, X-Axis

SPURIOUS RADIATED EMISSIONS

Work Order:	LGPD0108	**Date:**	07/14/13		
Project:	None	**Temperature:**	27.1 °C		
Job Site:	OC07	**Humidity:**	39.1% RH		
Serial Number:	SN0024	**Barometric Pres.:**	1011 mbar	**Tested by:**	Mark Baytan
EUT:	Zoll CF Card Module				
Configuration:	1				
Customer:	Logic Product Development				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 802.11(a), Channel 100				
Deviations:	None				
Comments:	Using Hyperterminal to program the CF Card. CF Card is powered up by the Defibrillator.				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	35	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



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
5470.000	32.9	35.6	1.3	289.0	1.0	0.0	Horz	PK	-9.5	59.0	74.0	-15.0	Ch 100, 5500 MHz,6 Mbps, X-Axis
5470.000	32.2	35.6	1.3	104.0	1.0	0.0	Vert	PK	-9.5	58.3	74.0	-15.7	Ch 100, 5500 MHz,6 Mbps, X-Axis
5470.000	31.2	35.6	1.3	114.0	1.0	0.0	Vert	PK	-9.5	57.3	74.0	-16.7	Ch 100, 5500 MHz, MCS7, X-Axis
5470.000	31.2	35.6	1.3	298.0	1.0	0.0	Horz	PK	-9.5	57.3	74.0	-16.7	Ch 100, 5500 MHz, MCS0, X-Axis
5470.000	31.0	35.6	1.3	114.0	1.0	0.0	Vert	PK	-9.5	57.1	74.0	-16.9	Ch 100, 5500 MHz, MCS0, X-Axis
5470.000	30.6	35.6	1.3	298.0	1.0	0.0	Horz	PK	-9.5	56.7	74.0	-17.3	Ch 100, 5500 MHz, 54 Mbps, X-Axis
5470.000	30.6	35.6	1.3	298.0	1.0	0.0	Horz	PK	-9.5	56.7	74.0	-17.3	Ch 100, 5500 MHz, MCS7, X-Axis
5470.000	30.4	35.6	1.3	298.0	1.0	0.0	Horz	PK	-9.5	56.5	74.0	-17.5	Ch 100, 5500 MHz, 36 Mbps, X-Axis
5470.000	30.3	35.6	1.3	114.0	1.0	0.0	Vert	PK	-9.5	56.4	74.0	-17.6	Ch 100, 5500 MHz, 36 Mbps, X-Axis
5470.000	30.2	35.6	1.3	114.0	1.0	0.0	Vert	PK	-9.5	56.3	74.0	-17.7	Ch 100, 5500 MHz, 54 Mbps, X-Axis
5470.000	18.6	35.6	1.3	289.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz,6 Mbps, X-Axis
5470.000	18.6	35.6	1.3	298.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, 36 Mbps, X-Axis
5470.000	18.6	35.6	1.3	298.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, 54 Mbps, X-Axis
5470.000	18.6	35.6	1.3	298.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, MCS0, X-Axis
5470.000	18.6	35.6	1.3	298.0	1.0	0.0	Horz	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, MCS7, X-Axis
5470.000	18.6	35.6	1.3	104.0	1.0	0.0	Vert	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz,6 Mbps, X-Axis
5470.000	18.6	35.6	1.3	114.0	1.0	0.0	Vert	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, 36 Mbps, X-Axis
5470.000	18.6	35.6	1.3	114.0	1.0	0.0	Vert	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, 54 Mbps, X-Axis
5470.000	18.6	35.6	1.3	114.0	1.0	0.0	Vert	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, MCS0, X-Axis
5470.000	18.6	35.6	1.3	114.0	1.0	0.0	Vert	AV	-9.5	44.7	74.0	-29.3	Ch 100, 5500 MHz, MCS7, X-Axis