

# NORTHWEST EMC

## Cardiocom

CD320 Commander Flex

FCC 15.207:2015

FCC 15.249.2015

Report # CCOM0021.1



NVLAP Lab Code: 200881-0

*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: July 08, 2015  
Cardiocom  
Model: CD320 Commander Flex

## Radio Equipment Testing

### Standards

Specification	Method
FCC 15.207:2015	ANSI C63.10:2009
FCC 15.249:2015	ANSI C63.10:2009

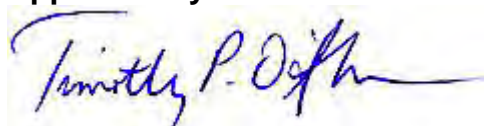
### Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Field Strength of Harmonics and Spurious Radiated Emissions	Yes	Pass	
6.6	Field Strength of Fundamental	Yes	Pass	

### Deviations From Test Standards

None

### Approved By:



Tim O'Shea, 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

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**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

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**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

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**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

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

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## Korea

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

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## Japan

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

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## Taiwan

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**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

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

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## Israel

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

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## Hong Kong

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

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## Vietnam

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**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

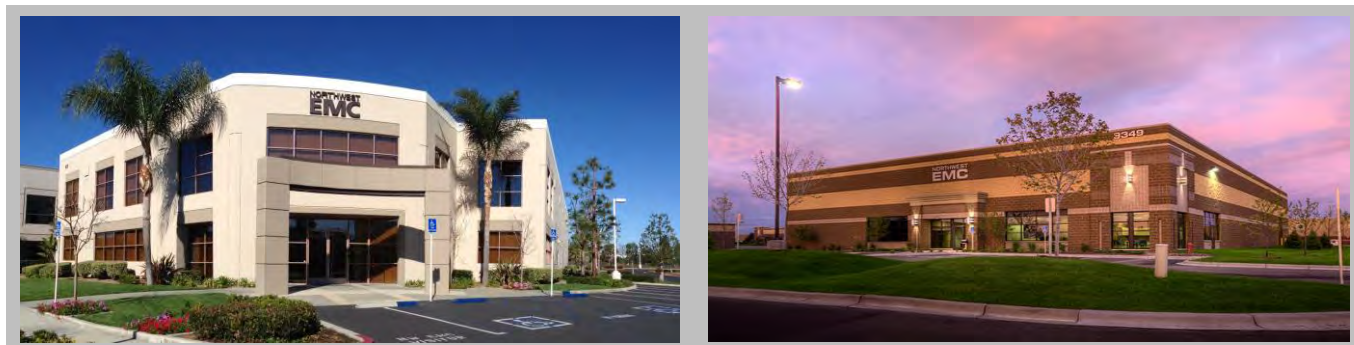
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement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

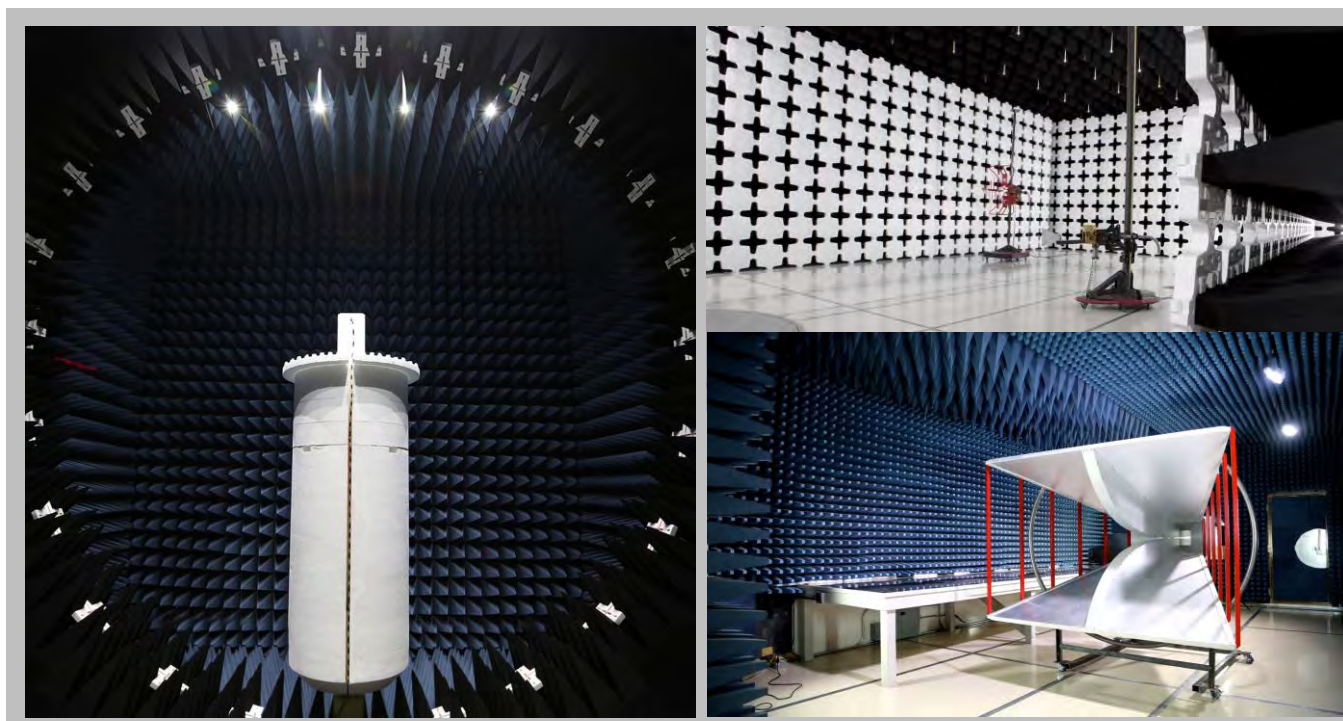
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

<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)	5.2 dB	-5.2 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>	Cardiocom
<b>Address:</b>	7980 Century Blvd
<b>City, State, Zip:</b>	Chanhassen, MN 55317
<b>Test Requested By:</b>	Viet Vuong
<b>Model:</b>	CD320 Commander Flex
<b>First Date of Test:</b>	June 29, 2015
<b>Last Date of Test:</b>	July 08, 2015
<b>Receipt Date of Samples:</b>	June 29, 2015
<b>Equipment Design Stage:</b>	Revision 2
<b>Equipment Condition:</b>	No Damage

## Information Provided by the Party Requesting the Test

<b>Functional Description of the EUT:</b>
The CD320 Commander Flex is the host/hub that collects bio-metric data and sends them to a centralized server.
<b>Testing Objective:</b>
Seeking to demonstrate compliance under FCC 15.249 for operation in the 2400 - 2483.5 MHz Band.



# CONFIGURATIONS

## Configuration CCOM0015- 1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub	Cardiocom	CD320 Commander Flex	9000000008

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None
Scale	Cardiocom	SC250	2S002272
SpO2 Finger Monitor	Cardiocom	PO100	1P104033
Serial Cradle	nSpire Health, Inc.	662114	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Cable	No	4.85m	Yes	AC Adapter	Data Hub
Scale Cable	No	1.85m	No	Data Hub	Scale
3.5mm Phone Cables (x3)	No	0.90m	No	Data Hub	Unterminated
Pulse Oximeter Cable	No	0.20m	No	Data Hub	Pulse Oximeter
Finger Monitor Cable	No	0.90m	No	Pulse Oximeter	Finger Monitor
Serial Cradle Cable	No	1.80m	No	Data Hub	Serial Cradle
USB Cable	No	1.85m	No	Data Hub	Mouse



# CONFIGURATIONS

## Configuration CCOM0015- 2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub	Cardiocom	CD320 Commander Flex	9000000008

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None
Scale	Cardiocom	SC250	2S002272
SpO2 Finger Monitor	Cardiocom	PO100	1P104033
Serial Cradle	nSpire Health, Inc.	662114	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub 2	Cardiocom	CD320 Commander Flex	1000036633
AC Adapter 2	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Cable	No	4.85m	Yes	AC Adapter	Data Hub
Scale Cable	No	1.85m	No	Data Hub	Scale
3.5mm Phone Cables (x3)	No	0.90m	No	Data Hub	Unterminated
Pulse Oximeter Cable	No	0.20m	No	Data Hub	Pulse Oximeter
Finger Monitor Cable	No	0.90m	No	Pulse Oximeter	Finger Monitor
Serial Cradle Cable	No	1.80m	No	Data Hub	Serial Cradle
USB Cable	No	1.85m	No	Data Hub	Mouse
DC Cable 2	No	4.85m	Yes	Data Hub 2	AC Adapter 2

# CONFIGURATIONS

## Configuration CCOM0015- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub	Cardiocom	CD320 Commander Flex	9000000009

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None
Scale	Cardiocom	SC250	2S002272
SpO2 Finger Monitor	Cardiocom	PO100	1P104033
Serial Cradle	nSpire Health, Inc.	662114	None

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub 2	Cardiocom	CD320 Commander Flex	1000036633
AC Adapter 2	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Cable	No	4.85m	Yes	AC Adapter	Data Hub
Scale Cable	No	1.85m	No	Data Hub	Scale
3.5mm Phone Cables (x3)	No	0.90m	No	Data Hub	Unterminated
Pulse Oximeter Cable	No	0.20m	No	Data Hub	Pulse Oximeter
Finger Monitor Cable	No	0.90m	No	Pulse Oximeter	Finger Monitor
Serial Cradle Cable	No	1.80m	No	Data Hub	Serial Cradle
USB Cable	No	1.85m	No	Data Hub	Mouse
DC Cable 2	No	4.85m	Yes	Data Hub 2	AC Adapter 2

# CONFIGURATIONS

## Configuration CCOM0015- 4

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Data Hub	Cardiocom	CD320 Commander Flex	9000000009

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC Adapter	Shenzhen Fujia Appliance Co. Ltd.	FJ-SW0701100U	None
Scale	Cardiocom	SC250	2S002272
SpO2 Finger Monitor	Cardiocom	PO100	1P104033
Serial Cradle	nSpire Health, Inc.	662114	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Cable	No	4.85m	Yes	AC Adapter	Data Hub
Scale Cable	No	1.85m	No	Data Hub	Scale
3.5mm Phone Cables (x3)	No	0.90m	No	Data Hub	Unterminated
Pulse Oximeter Cable	No	0.20m	No	Data Hub	Pulse Oximeter
Finger Monitor Cable	No	0.90m	No	Pulse Oximeter	Finger Monitor
Serial Cradle Cable	No	1.80m	No	Data Hub	Serial Cradle
USB Cable	No	1.85m	No	Data Hub	Mouse

# MODIFICATIONS

## Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/29/2015	Powerline Conducted 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	7/8/2015	Field Strength of Fundamental	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.
3	7/8/2015	Field Strength of Harmonic and Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

# POWERLINE CONDUCTED EMISSIONS

## TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50  $\Omega$  measuring port is terminated by a 50  $\Omega$  EMI meter or a 50  $\Omega$  resistive load. All 50  $\Omega$  measuring ports of the LISN are terminated by 50 $\Omega$ .

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESR7	ARI	5/21/2015	05/21/2016
Attenuator 20dB, BNC	Fairview Microwave	SA01B-20	AQP	7/22/2014	07/22/2015
High Pass Filter	TTE	H97-100K-50-720B	HGN	5/11/2015	05/11/2016
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/23/2015	03/23/2016
Cable	ESM Cable Corp.	Conducted Cables	MNC	5/13/2015	05/13/2016

## MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

## CONFIGURATIONS INVESTIGATED

CCOM0015-3

## MODES INVESTIGATED

Transmitting channel 10  
Transmitting channel 8  
Transmitting channel 9

# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	5	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

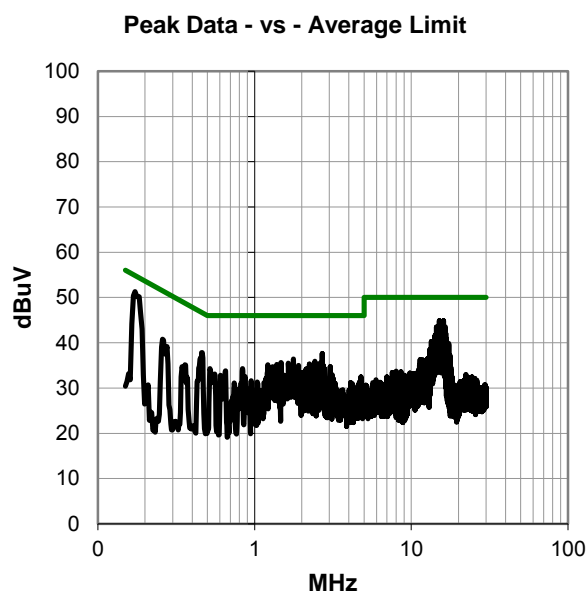
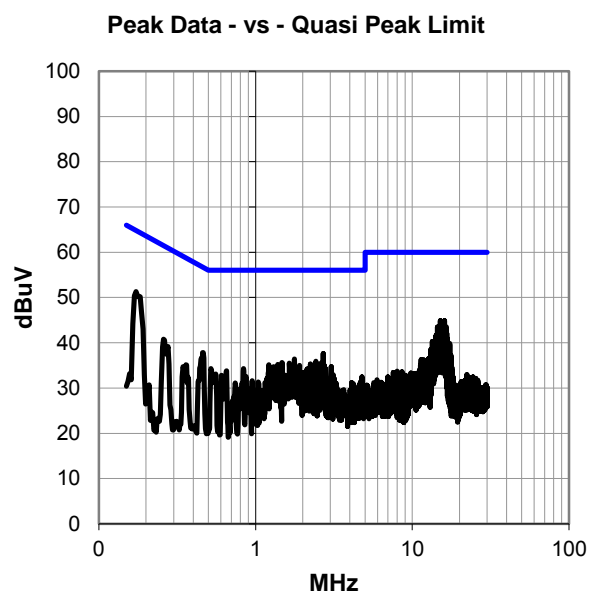
None

## EUT OPERATING MODES

Transmitting channel 8

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #5

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.172	30.9	20.4	51.3	64.8	-13.6
16.062	23.7	21.2	44.9	60.0	-15.1
15.125	23.8	21.1	44.9	60.0	-15.1
16.051	22.8	21.2	44.0	60.0	-16.0
14.931	22.5	21.1	43.6	60.0	-16.4
16.495	22.2	21.3	43.5	60.0	-16.5
14.465	22.4	21.0	43.4	60.0	-16.6
14.913	22.2	21.1	43.3	60.0	-16.7
15.595	22.1	21.1	43.2	60.0	-16.8
15.051	21.8	21.1	42.9	60.0	-17.1
14.592	21.8	21.1	42.9	60.0	-17.1
16.315	21.6	21.2	42.8	60.0	-17.2
14.756	21.6	21.1	42.7	60.0	-17.3
15.614	21.5	21.1	42.6	60.0	-17.4
15.961	21.3	21.2	42.5	60.0	-17.5
14.857	21.3	21.1	42.4	60.0	-17.6
15.954	21.1	21.2	42.3	60.0	-17.7
15.894	21.0	21.2	42.2	60.0	-17.8
15.368	21.0	21.1	42.1	60.0	-17.9
16.166	20.9	21.2	42.1	60.0	-17.9
15.991	20.9	21.2	42.1	60.0	-17.9
16.618	20.8	21.3	42.1	60.0	-17.9
14.797	21.0	21.1	42.1	60.0	-17.9
14.499	20.8	21.0	41.8	60.0	-18.2
15.498	20.7	21.1	41.8	60.0	-18.2
14.957	20.7	21.1	41.8	60.0	-18.2

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.172	30.9	20.4	51.3	54.8	-3.6
16.062	23.7	21.2	44.9	50.0	-5.1
15.125	23.8	21.1	44.9	50.0	-5.1
16.051	22.8	21.2	44.0	50.0	-6.0
14.931	22.5	21.1	43.6	50.0	-6.4
16.495	22.2	21.3	43.5	50.0	-6.5
14.465	22.4	21.0	43.4	50.0	-6.6
14.913	22.2	21.1	43.3	50.0	-6.7
15.595	22.1	21.1	43.2	50.0	-6.8
15.051	21.8	21.1	42.9	50.0	-7.1
14.592	21.8	21.1	42.9	50.0	-7.1
16.315	21.6	21.2	42.8	50.0	-7.2
14.756	21.6	21.1	42.7	50.0	-7.3
15.614	21.5	21.1	42.6	50.0	-7.4
15.961	21.3	21.2	42.5	50.0	-7.5
14.857	21.3	21.1	42.4	50.0	-7.6
15.954	21.1	21.2	42.3	50.0	-7.7
15.894	21.0	21.2	42.2	50.0	-7.8
15.368	21.0	21.1	42.1	50.0	-7.9
16.166	20.9	21.2	42.1	50.0	-7.9
15.991	20.9	21.2	42.1	50.0	-7.9
16.618	20.8	21.3	42.1	50.0	-7.9
14.797	21.0	21.1	42.1	50.0	-7.9
14.499	20.8	21.0	41.8	50.0	-8.2
15.498	20.7	21.1	41.8	50.0	-8.2
14.957	20.7	21.1	41.8	50.0	-8.2

## CONCLUSION

Pass



Tested By



# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	6	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

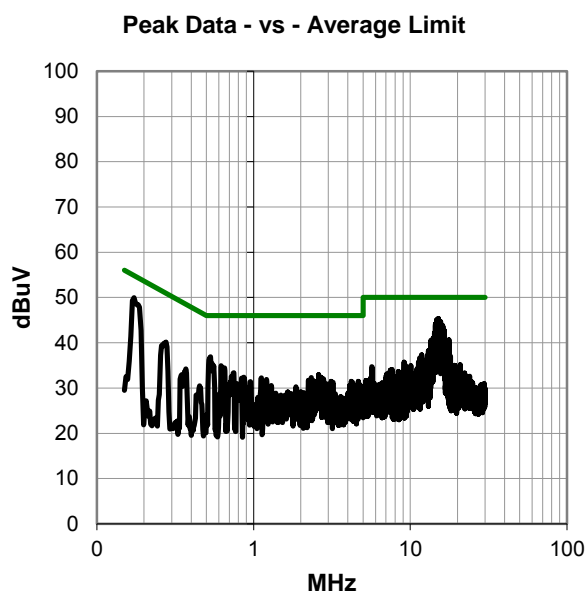
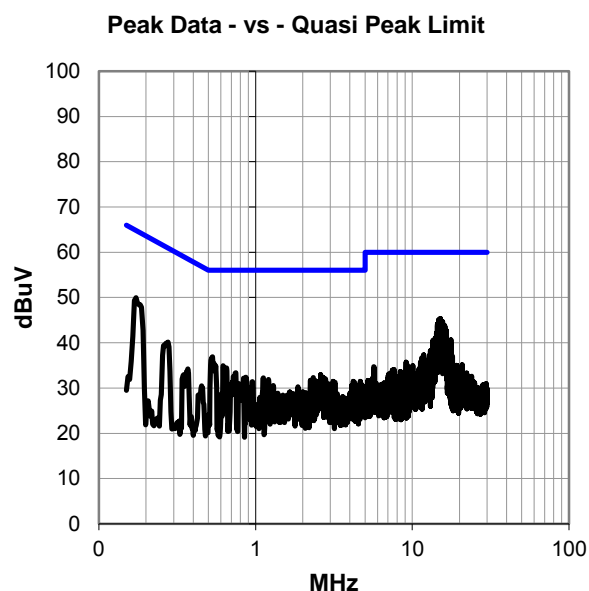
None

## EUT OPERATING MODES

Transmitting channel 8

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #6

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
15.140	24.3	21.1	45.4	60.0	-14.6
0.172	29.6	20.4	50.0	64.8	-14.9
14.763	24.0	21.1	45.1	60.0	-14.9
14.857	23.9	21.1	45.0	60.0	-15.0
15.595	23.5	21.1	44.6	60.0	-15.4
14.950	23.3	21.1	44.4	60.0	-15.6
14.484	23.1	21.0	44.1	60.0	-15.9
14.465	22.8	21.0	43.8	60.0	-16.2
16.054	22.6	21.2	43.8	60.0	-16.2
15.043	22.7	21.1	43.8	60.0	-16.2
14.805	22.7	21.1	43.8	60.0	-16.2
15.704	22.6	21.2	43.8	60.0	-16.2
16.144	22.4	21.2	43.6	60.0	-16.4
15.786	22.1	21.2	43.3	60.0	-16.7
16.077	22.0	21.2	43.2	60.0	-16.8
15.898	22.0	21.2	43.2	60.0	-16.8
14.592	22.1	21.1	43.2	60.0	-16.8
15.980	21.9	21.2	43.1	60.0	-16.9
15.125	21.9	21.1	43.0	60.0	-17.0
14.969	21.9	21.1	43.0	60.0	-17.0
15.730	21.7	21.2	42.9	60.0	-17.1
16.245	21.6	21.2	42.8	60.0	-17.2
16.521	21.4	21.3	42.7	60.0	-17.3
14.569	21.6	21.0	42.6	60.0	-17.4
16.502	21.3	21.3	42.6	60.0	-17.4
15.025	21.4	21.1	42.5	60.0	-17.5

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
15.140	24.3	21.1	45.4	50.0	-4.6
0.172	29.6	20.4	50.0	54.8	-4.9
14.763	24.0	21.1	45.1	50.0	-4.9
14.857	23.9	21.1	45.0	50.0	-5.0
15.595	23.5	21.1	44.6	50.0	-5.4
14.950	23.3	21.1	44.4	50.0	-5.6
14.484	23.1	21.0	44.1	50.0	-5.9
14.465	22.8	21.0	43.8	50.0	-6.2
16.054	22.6	21.2	43.8	50.0	-6.2
15.043	22.7	21.1	43.8	50.0	-6.2
14.805	22.7	21.1	43.8	50.0	-6.2
15.704	22.6	21.2	43.8	50.0	-6.2
16.144	22.4	21.2	43.6	50.0	-6.4
15.786	22.1	21.2	43.3	50.0	-6.7
16.077	22.0	21.2	43.2	50.0	-6.8
15.898	22.0	21.2	43.2	50.0	-6.8
14.592	22.1	21.1	43.2	50.0	-6.8
15.980	21.9	21.2	43.1	50.0	-6.9
15.125	21.9	21.1	43.0	50.0	-7.0
14.969	21.9	21.1	43.0	50.0	-7.0
15.730	21.7	21.2	42.9	50.0	-7.1
16.245	21.6	21.2	42.8	50.0	-7.2
16.521	21.4	21.3	42.7	50.0	-7.3
14.569	21.6	21.0	42.6	50.0	-7.4
16.502	21.3	21.3	42.6	50.0	-7.4
15.025	21.4	21.1	42.5	50.0	-7.5

## CONCLUSION

Pass



Tested By

# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	7	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

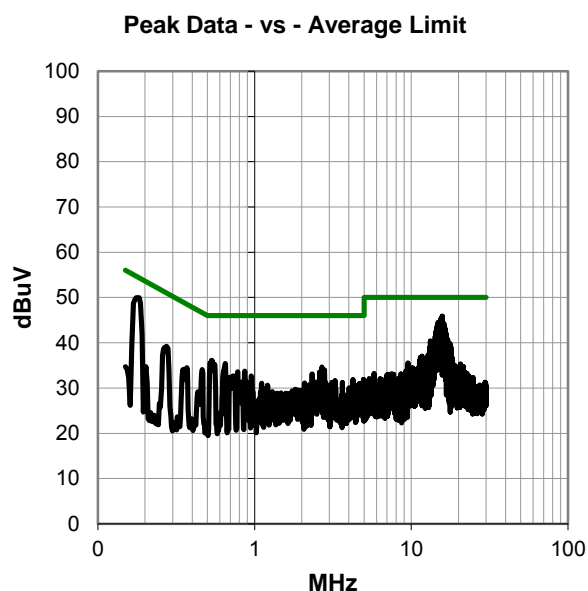
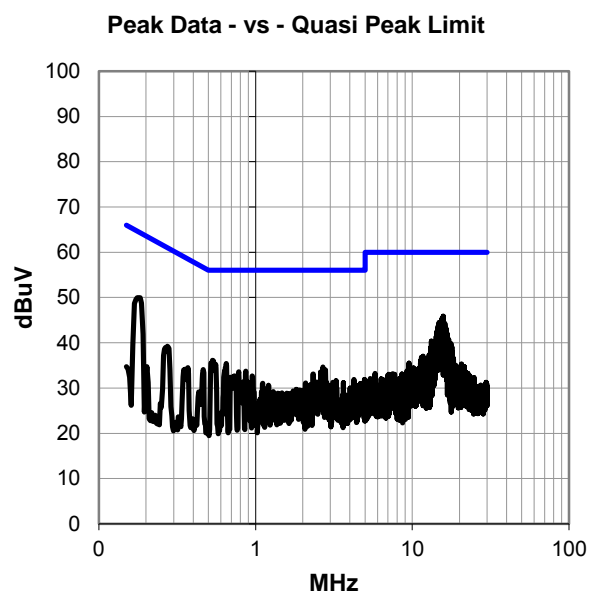
None

## EUT OPERATING MODES

Transmitting channel 9

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #7

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
15.797	24.7	21.2	45.9	60.0	-14.1
15.487	24.2	21.1	45.3	60.0	-14.7
0.176	29.6	20.4	50.0	64.7	-14.7
15.569	24.0	21.1	45.1	60.0	-14.9
14.846	23.4	21.1	44.5	60.0	-15.5
15.536	23.2	21.1	44.3	60.0	-15.7
16.148	23.0	21.2	44.2	60.0	-15.8
16.047	22.8	21.2	44.0	60.0	-16.0
14.898	22.8	21.1	43.9	60.0	-16.1
14.763	22.8	21.1	43.9	60.0	-16.1
14.984	22.7	21.1	43.8	60.0	-16.2
14.592	22.5	21.1	43.6	60.0	-16.4
15.021	22.4	21.1	43.5	60.0	-16.5
15.689	22.3	21.2	43.5	60.0	-16.5
15.219	22.1	21.1	43.2	60.0	-16.8
15.976	21.8	21.2	43.0	60.0	-17.0
15.767	21.8	21.2	43.0	60.0	-17.0
16.524	21.7	21.3	43.0	60.0	-17.0
14.954	21.8	21.1	42.9	60.0	-17.1
14.652	21.6	21.1	42.7	60.0	-17.3
15.722	21.4	21.2	42.6	60.0	-17.4
16.338	21.3	21.2	42.5	60.0	-17.5
15.155	21.4	21.1	42.5	60.0	-17.5
14.909	21.4	21.1	42.5	60.0	-17.5
14.749	21.4	21.1	42.5	60.0	-17.5
14.331	21.4	21.0	42.4	60.0	-17.6

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
15.797	24.7	21.2	45.9	50.0	-4.1
15.487	24.2	21.1	45.3	50.0	-4.7
0.176	29.6	20.4	50.0	54.7	-4.7
15.569	24.0	21.1	45.1	50.0	-4.9
14.846	23.4	21.1	44.5	50.0	-5.5
15.536	23.2	21.1	44.3	50.0	-5.7
16.148	23.0	21.2	44.2	50.0	-5.8
16.047	22.8	21.2	44.0	50.0	-6.0
14.898	22.8	21.1	43.9	50.0	-6.1
14.763	22.8	21.1	43.9	50.0	-6.1
14.984	22.7	21.1	43.8	50.0	-6.2
14.592	22.5	21.1	43.6	50.0	-6.4
15.021	22.4	21.1	43.5	50.0	-6.5
15.689	22.3	21.2	43.5	50.0	-6.5
15.219	22.1	21.1	43.2	50.0	-6.8
15.976	21.8	21.2	43.0	50.0	-7.0
15.767	21.8	21.2	43.0	50.0	-7.0
16.524	21.7	21.3	43.0	50.0	-7.0
14.954	21.8	21.1	42.9	50.0	-7.1
14.652	21.6	21.1	42.7	50.0	-7.3
15.722	21.4	21.2	42.6	50.0	-7.4
16.338	21.3	21.2	42.5	50.0	-7.5
15.155	21.4	21.1	42.5	50.0	-7.5
14.909	21.4	21.1	42.5	50.0	-7.5
14.749	21.4	21.1	42.5	50.0	-7.5
14.331	21.4	21.0	42.4	50.0	-7.6

## CONCLUSION

Pass



Tested By

# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	8	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

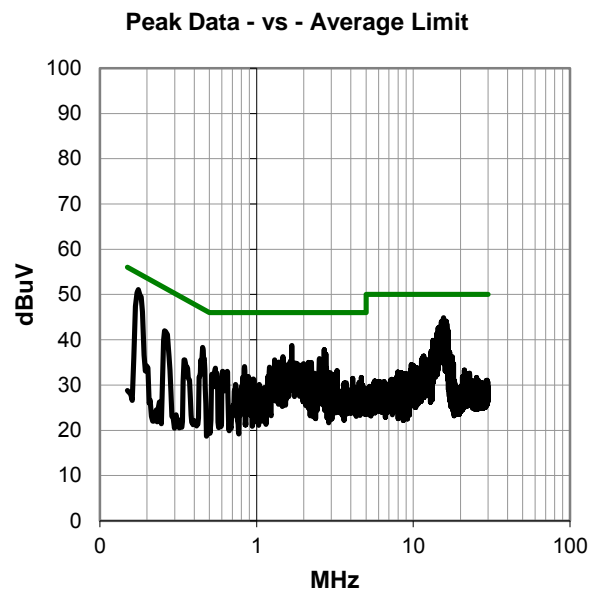
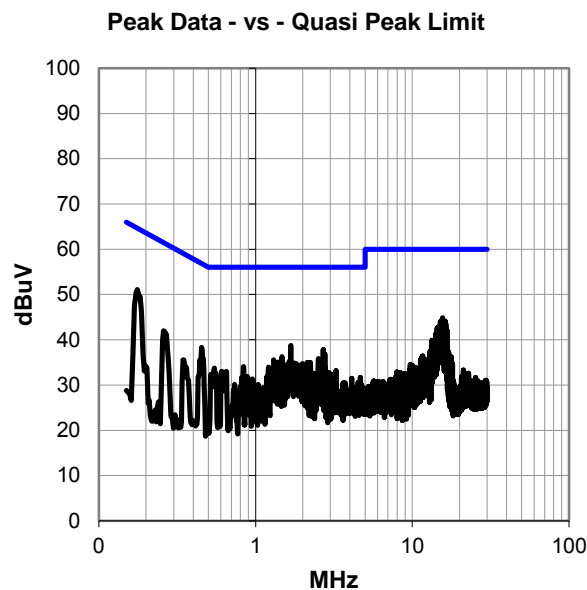
None

## EUT OPERATING MODES

Transmitting channel 9

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #8

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	30.7	20.4	51.1	64.7	-13.6
15.588	23.7	21.1	44.8	60.0	-15.2
16.237	22.9	21.2	44.1	60.0	-15.9
15.211	22.9	21.1	44.0	60.0	-16.0
15.118	22.9	21.1	44.0	60.0	-16.0
15.976	22.8	21.2	44.0	60.0	-16.0
16.412	22.3	21.2	43.5	60.0	-16.5
16.062	21.9	21.2	43.1	60.0	-16.9
15.364	21.9	21.1	43.0	60.0	-17.0
15.166	21.8	21.1	42.9	60.0	-17.1
15.409	21.7	21.1	42.8	60.0	-17.2
15.144	21.7	21.1	42.8	60.0	-17.2
1.680	18.5	20.3	38.8	56.0	-17.2
14.625	21.7	21.1	42.8	60.0	-17.2
14.428	21.6	21.0	42.6	60.0	-17.4
14.909	21.5	21.1	42.6	60.0	-17.4
15.252	21.3	21.1	42.4	60.0	-17.6
15.196	21.2	21.1	42.3	60.0	-17.7
14.857	21.1	21.1	42.2	60.0	-17.8
14.674	21.1	21.1	42.2	60.0	-17.8
16.327	20.9	21.2	42.1	60.0	-17.9
14.816	21.0	21.1	42.1	60.0	-17.9
15.480	20.9	21.1	42.0	60.0	-18.0
16.151	20.8	21.2	42.0	60.0	-18.0
15.081	20.9	21.1	42.0	60.0	-18.0
15.032	20.9	21.1	42.0	60.0	-18.0

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	30.7	20.4	51.1	54.7	-3.6
15.588	23.7	21.1	44.8	50.0	-5.2
16.237	22.9	21.2	44.1	50.0	-5.9
15.211	22.9	21.1	44.0	50.0	-6.0
15.118	22.9	21.1	44.0	50.0	-6.0
15.976	22.8	21.2	44.0	50.0	-6.0
16.412	22.3	21.2	43.5	50.0	-6.5
16.062	21.9	21.2	43.1	50.0	-6.9
15.364	21.9	21.1	43.0	50.0	-7.0
15.166	21.8	21.1	42.9	50.0	-7.1
15.409	21.7	21.1	42.8	50.0	-7.2
15.144	21.7	21.1	42.8	50.0	-7.2
1.680	18.5	20.3	38.8	46.0	-7.2
14.625	21.7	21.1	42.8	50.0	-7.2
14.428	21.6	21.0	42.6	50.0	-7.4
14.909	21.5	21.1	42.6	50.0	-7.4
15.252	21.3	21.1	42.4	50.0	-7.6
15.196	21.2	21.1	42.3	50.0	-7.7
14.857	21.1	21.1	42.2	50.0	-7.8
14.674	21.1	21.1	42.2	50.0	-7.8
16.327	20.9	21.2	42.1	50.0	-7.9
14.816	21.0	21.1	42.1	50.0	-7.9
15.480	20.9	21.1	42.0	50.0	-8.0
16.151	20.8	21.2	42.0	50.0	-8.0
15.081	20.9	21.1	42.0	50.0	-8.0
15.032	20.9	21.1	42.0	50.0	-8.0

## CONCLUSION

Pass



Tested By

# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	9	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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## COMMENTS

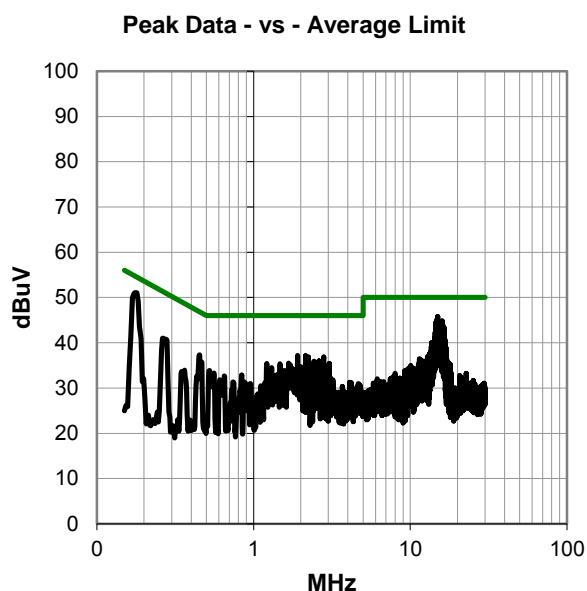
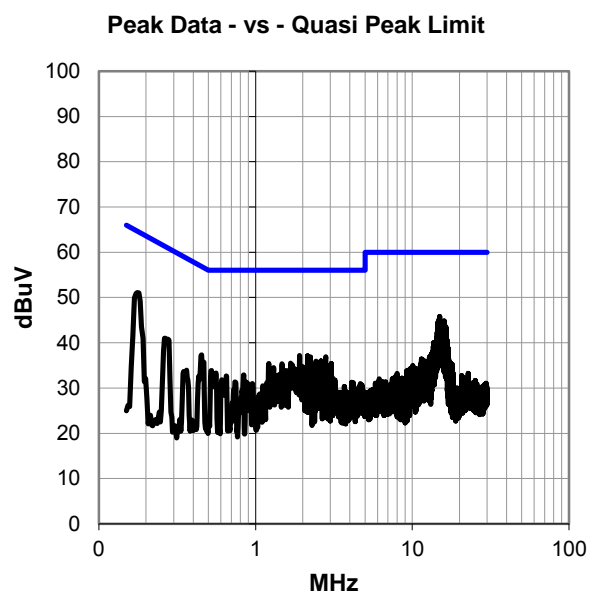
None

## EUT OPERATING MODES

Transmitting channel 10

## DEVIATIONS FROM TEST STANDARD

None





# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #9

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	30.7	20.4	51.1	64.7	-13.6
14.950	24.7	21.1	45.8	60.0	-14.2
14.860	24.1	21.1	45.2	60.0	-14.8
15.991	23.6	21.2	44.8	60.0	-15.2
15.122	23.7	21.1	44.8	60.0	-15.2
14.562	23.4	21.0	44.4	60.0	-15.6
14.670	23.1	21.1	44.2	60.0	-15.8
16.166	22.6	21.2	43.8	60.0	-16.2
15.595	22.5	21.1	43.6	60.0	-16.4
16.431	22.1	21.2	43.3	60.0	-16.7
15.808	21.7	21.2	42.9	60.0	-17.1
15.207	21.7	21.1	42.8	60.0	-17.2
15.151	21.7	21.1	42.8	60.0	-17.2
15.036	21.7	21.1	42.8	60.0	-17.2
15.879	21.5	21.2	42.7	60.0	-17.3
14.745	21.5	21.1	42.6	60.0	-17.4
14.816	21.4	21.1	42.5	60.0	-17.5
15.685	21.3	21.2	42.5	60.0	-17.5
15.174	21.3	21.1	42.4	60.0	-17.6
14.417	21.2	21.0	42.2	60.0	-17.8
16.524	20.9	21.3	42.2	60.0	-17.8
15.569	20.8	21.1	41.9	60.0	-18.1
14.980	20.8	21.1	41.9	60.0	-18.1
16.069	20.6	21.2	41.8	60.0	-18.2
15.237	20.7	21.1	41.8	60.0	-18.2
15.282	20.4	21.1	41.5	60.0	-18.5

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	30.7	20.4	51.1	54.7	-3.6
14.950	24.7	21.1	45.8	50.0	-4.2
14.860	24.1	21.1	45.2	50.0	-4.8
15.991	23.6	21.2	44.8	50.0	-5.2
15.122	23.7	21.1	44.8	50.0	-5.2
14.562	23.4	21.0	44.4	50.0	-5.6
14.670	23.1	21.1	44.2	50.0	-5.8
16.166	22.6	21.2	43.8	50.0	-6.2
15.595	22.5	21.1	43.6	50.0	-6.4
16.431	22.1	21.2	43.3	50.0	-6.7
15.808	21.7	21.2	42.9	50.0	-7.1
15.207	21.7	21.1	42.8	50.0	-7.2
15.151	21.7	21.1	42.8	50.0	-7.2
15.036	21.7	21.1	42.8	50.0	-7.2
15.879	21.5	21.2	42.7	50.0	-7.3
14.745	21.5	21.1	42.6	50.0	-7.4
14.816	21.4	21.1	42.5	50.0	-7.5
15.685	21.3	21.2	42.5	50.0	-7.5
15.174	21.3	21.1	42.4	50.0	-7.6
14.417	21.2	21.0	42.2	50.0	-7.8
16.524	20.9	21.3	42.2	50.0	-7.8
15.569	20.8	21.1	41.9	50.0	-8.1
14.980	20.8	21.1	41.9	50.0	-8.1
16.069	20.6	21.2	41.8	50.0	-8.2
15.237	20.7	21.1	41.8	50.0	-8.2
15.282	20.4	21.1	41.5	50.0	-8.5

## CONCLUSION

Pass



Tested By

# POWERLINE CONDUCTED EMISSIONS

EUT:	CD320 Commander Flex	Work Order:	CCOM0015
Serial Number:	9000000009	Date:	06/29/2015
Customer:	Cardiocom	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	980 mb
Tested By:	Dustin Sparks	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	CCOM0015-3

## TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2015	ANSI C63.10:2009

## TEST PARAMETERS

Run #:	10	Line:	High Line	Add. Ext. Attenuation (dB):	0
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## COMMENTS

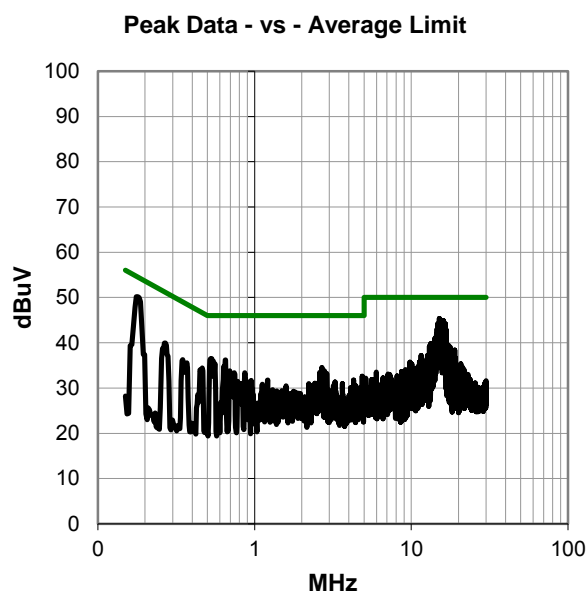
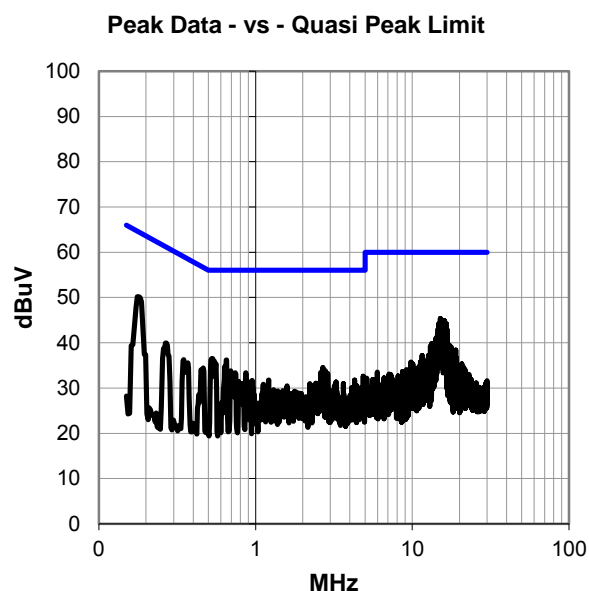
None

## EUT OPERATING MODES

Transmitting channel 10

## DEVIATIONS FROM TEST STANDARD

None



# POWERLINE CONDUCTED EMISSIONS

## RESULTS - Run #10

Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	29.8	20.4	50.2	64.7	-14.5
15.125	24.3	21.1	45.4	60.0	-14.6
16.069	23.7	21.2	44.9	60.0	-15.1
15.797	23.1	21.2	44.3	60.0	-15.7
15.711	23.1	21.2	44.3	60.0	-15.7
15.028	23.1	21.1	44.2	60.0	-15.8
14.946	23.1	21.1	44.2	60.0	-15.8
14.771	23.1	21.1	44.2	60.0	-15.8
16.521	22.9	21.3	44.2	60.0	-15.8
16.151	22.9	21.2	44.1	60.0	-15.9
15.875	22.3	21.2	43.5	60.0	-16.5
14.890	22.3	21.1	43.4	60.0	-16.6
16.177	22.0	21.2	43.2	60.0	-16.8
14.599	22.0	21.1	43.1	60.0	-16.9
15.987	21.8	21.2	43.0	60.0	-17.0
15.603	21.7	21.1	42.8	60.0	-17.2
16.771	21.5	21.3	42.8	60.0	-17.2
14.957	21.7	21.1	42.8	60.0	-17.2
16.092	21.5	21.2	42.7	60.0	-17.3
15.636	21.4	21.2	42.6	60.0	-17.4
15.566	21.3	21.1	42.4	60.0	-17.6
16.260	21.2	21.2	42.4	60.0	-17.6
15.040	21.3	21.1	42.4	60.0	-17.6
15.689	21.2	21.2	42.4	60.0	-17.6
15.204	21.2	21.1	42.3	60.0	-17.7
15.222	21.1	21.1	42.2	60.0	-17.8

Peak Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.176	29.8	20.4	50.2	54.7	-4.5
15.125	24.3	21.1	45.4	50.0	-4.6
16.069	23.7	21.2	44.9	50.0	-5.1
15.797	23.1	21.2	44.3	50.0	-5.7
15.711	23.1	21.2	44.3	50.0	-5.7
15.028	23.1	21.1	44.2	50.0	-5.8
14.946	23.1	21.1	44.2	50.0	-5.8
14.771	23.1	21.1	44.2	50.0	-5.8
16.521	22.9	21.3	44.2	50.0	-5.8
16.151	22.9	21.2	44.1	50.0	-5.9
15.875	22.3	21.2	43.5	50.0	-6.5
14.890	22.3	21.1	43.4	50.0	-6.6
16.177	22.0	21.2	43.2	50.0	-6.8
14.599	22.0	21.1	43.1	50.0	-6.9
15.987	21.8	21.2	43.0	50.0	-7.0
15.603	21.7	21.1	42.8	50.0	-7.2
16.771	21.5	21.3	42.8	50.0	-7.2
14.957	21.7	21.1	42.8	50.0	-7.2
16.092	21.5	21.2	42.7	50.0	-7.3
15.636	21.4	21.2	42.6	50.0	-7.4
15.566	21.3	21.1	42.4	50.0	-7.6
16.260	21.2	21.2	42.4	50.0	-7.6
15.040	21.3	21.1	42.4	50.0	-7.6
15.689	21.2	21.2	42.4	50.0	-7.6
15.204	21.2	21.1	42.3	50.0	-7.7
15.222	21.1	21.1	42.2	50.0	-7.8

## CONCLUSION

Pass



Tested By

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 low power, low channel and high channel.

## POWER SETTINGS INVESTIGATED

110VAC/60Hz

## CONFIGURATIONS INVESTIGATED

CCOM0015 - 4

## FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 26500 MHz

## 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
Low Pass Filter, 0 - 1000 MHz	Micro-Tronics	LPM50004	HGK	3/2/2015	12 mo
High Pass Filter, 2.8 - 18 GHz	Micro-Tronics	HPM50111	HGQ	3/2/2015	12 mo
Attenuator, 20 dB, 'SMA'	S.M. Electronics	SA6-20	REO	3/2/2015	12 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	10/3/2014	12 mo
MN05 Cable	Northwest EMC	18-26GHz Standard Gain Horn Cable	MNP	10/3/2014	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AHG	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	5/5/2015	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	3/2/2015	12 mo
Antenna, Horn	ETS Lindgren	3160-07	AXP	NCR	0 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/5/2015	12 mo
Antenna, Horn	ETS Lindgren	3115	AJA	6/3/2014	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	3/2/2015	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	3/30/2015	12 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 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

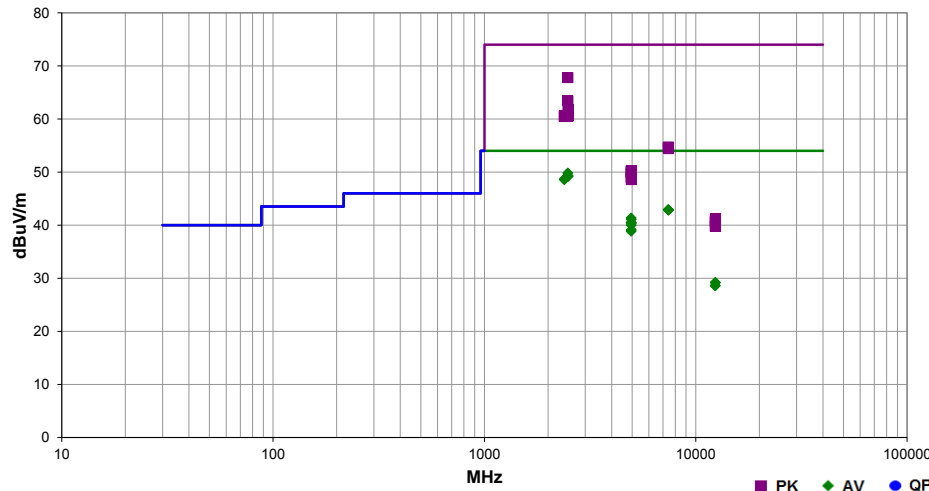
## TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Work Order:	CCOM0015	Date:	07/08/15	
Project:	None	Temperature:	23.4 °C	
Job Site:	MN05	Humidity:	44.5% RH	
Serial Number:	9000000009	Barometric Pres.:	989.1 mbar	
EUT:		CD320 Commander Flex		
Configuration:	4			
Customer:	Cardiocom			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting low power; low channel and high channel.			
Deviations:	None			
Comments:	None			

Test Specifications	FCC 15.249:2015	Test Method	ANSI C63.10:2009
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Run #	13	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
2483.650	31.7	-1.9	1.0	353.0	3.0	20.0	Vert	AV	0.0	49.8	54.0	-4.2	High ch, EUT on side
2484.158	31.2	-1.9	1.0	187.0	3.0	20.0	Horz	AV	0.0	49.3	54.0	-4.7	High ch, EUT on side
2486.483	31.1	-1.9	1.0	156.1	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, EUT horz
2485.217	31.1	-1.9	1.0	271.9	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	High ch, EUT horz
2484.933	31.1	-1.9	3.1	225.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	High ch, EUT vert
2484.483	31.1	-1.9	3.3	96.0	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, EUT vert
2389.108	30.9	-2.2	1.3	335.0	3.0	20.0	Vert	AV	0.0	48.7	54.0	-5.3	Low ch, EUT on side
2389.433	30.8	-2.2	1.0	224.1	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	Low ch, EUT on side
2483.525	49.7	-1.9	1.0	353.0	3.0	20.0	Vert	PK	0.0	67.8	74.0	-6.2	High ch, EUT on side
2483.550	45.3	-1.9	1.0	187.0	3.0	20.0	Horz	PK	0.0	63.4	74.0	-10.6	High ch, EUT on side
7421.633	28.3	14.6	1.0	0.0	3.0	0.0	Vert	AV	0.0	42.9	54.0	-11.1	Low ch, EUT on side
7421.058	28.3	14.6	1.0	308.9	3.0	0.0	Horz	AV	0.0	42.9	54.0	-11.1	Low ch, EUT on side
7437.350	28.2	14.6	1.0	149.1	3.0	0.0	Horz	AV	0.0	42.8	54.0	-11.2	High ch, EUT on side
7435.125	28.2	14.6	1.0	22.1	3.0	0.0	Vert	AV	0.0	42.8	54.0	-11.2	High ch, EUT on side
2486.758	43.6	-1.9	1.0	156.1	3.0	20.0	Horz	PK	0.0	61.7	74.0	-12.3	High ch, EUT horz
4947.292	34.6	6.7	1.0	250.0	3.0	0.0	Vert	AV	0.0	41.3	54.0	-12.7	Low ch, EUT on side
4957.392	34.3	6.8	1.0	240.9	3.0	0.0	Vert	AV	0.0	41.1	54.0	-12.9	High ch, EUT on side
2487.292	42.5	-1.9	3.1	225.0	3.0	20.0	Vert	PK	0.0	60.6	74.0	-13.4	High ch, EUT vert
2485.233	42.5	-1.9	3.3	96.0	3.0	20.0	Horz	PK	0.0	60.6	74.0	-13.4	High ch, EUT vert
2387.400	42.8	-2.2	1.0	224.1	3.0	20.0	Horz	PK	0.0	60.6	74.0	-13.4	Low ch, EUT on side
2483.800	42.4	-1.9	1.0	271.9	3.0	20.0	Vert	PK	0.0	60.5	74.0	-13.5	High ch, EUT horz
4957.358	33.7	6.8	1.0	325.0	3.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	High ch, EUT on side
2389.308	42.7	-2.2	1.3	335.0	3.0	20.0	Vert	PK	0.0	60.5	74.0	-13.5	Low ch, EUT on side
4957.358	33.6	6.8	1.0	206.1	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	High ch, EUT vert
4957.283	33.6	6.8	1.0	311.9	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	High ch, EUT horz
4957.417	33.2	6.8	1.0	256.0	3.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	High ch, EUT vert
4957.342	32.3	6.8	1.0	358.9	3.0	0.0	Vert	AV	0.0	39.1	54.0	-14.9	High ch, EUT horz
4947.367	32.1	6.7	1.0	267.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low ch, EUT on side
7420.383	40.1	14.6	1.0	308.9	3.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	Low ch, EUT on side
7436.575	40.0	14.6	1.0	149.1	3.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	High ch, EUT on side
7420.125	40.0	14.6	1.0	0.0	3.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	Low ch, EUT on side
7434.367	39.8	14.6	1.0	22.1	3.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	High ch, EUT on side
4947.292	43.5	6.7	1.0	250.0	3.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Low ch, EUT on side
4957.642	43.4	6.8	1.0	206.1	3.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8	High ch, EUT vert
4957.175	43.1	6.8	1.0	240.9	3.0	0.0	Vert	PK	0.0	49.9	74.0	-24.1	High ch, EUT on side
4956.892	43.1	6.8	1.0	311.9	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	High ch, EUT horz
4957.708	43.0	6.8	1.0	325.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	High ch, EUT on side
4957.342	42.4	6.8	1.0	256.0	3.0	0.0	Vert	PK	0.0	49.2	74.0	-24.8	High ch, EUT vert
12396.270	31.9	-2.7	1.3	260.0	3.0	0.0	Vert	AV	0.0	29.2	54.0	-24.8	High ch, EUT on side
12394.430	31.9	-2.7	1.0	63.0	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	High ch, EUT on side
4947.375	42.2	6.7	1.0	267.0	3.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Low ch, EUT on side
4957.892	41.8	6.8	1.0	358.9	3.0	0.0	Vert	PK	0.0	48.6	74.0	-25.4	High ch, EUT horz
12366.210	31.4	-2.8	1.0	207.0	3.0	0.0	Horz	AV	0.0	28.6	54.0	-25.4	Low ch, EUT on side
12366.100	31.4	-2.8	1.9	232.9	3.0	0.0	Vert	AV	0.0	28.6	54.0	-25.4	Low ch, EUT on side
12395.840	43.9	-2.7	1.0	63.0	3.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	High ch, EUT on side
12366.720	43.5	-2.8	1.0	207.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Low ch, EUT on side
12394.980	43.2	-2.7	1.3	260.0	3.0	0.0	Vert	PK	0.0	40.5	74.0	-33.5	High ch, EUT on side
12366.050	42.6	-2.8	1.9	232.9	3.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	Low ch, EUT on side

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 low channel and high channel

## POWER SETTINGS INVESTIGATED

110VAC/60Hz

## CONFIGURATIONS INVESTIGATED

CCOM0015 - 4

## FREQUENCY RANGE INVESTIGATED

Start Frequency	2473 MHz	Stop Frequency	2479 MHz
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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
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/5/2015	12 mo
Antenna, Horn	ETS Lindgren	3115	AJA	6/3/2014	24 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2015	12 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 antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes.



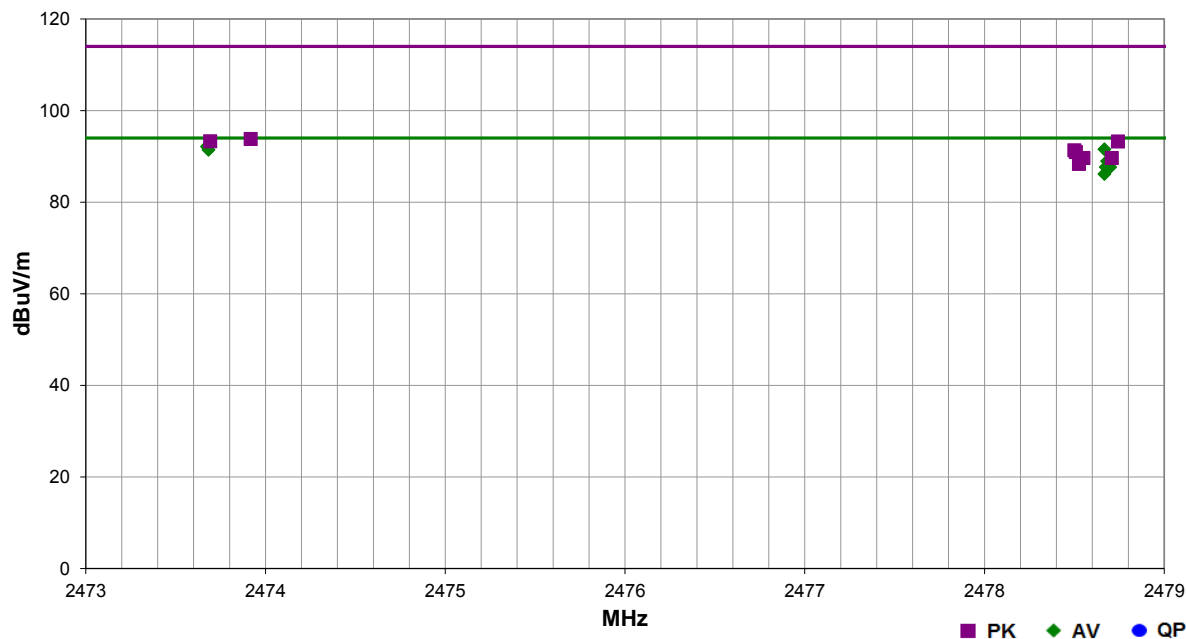
# FIELD STRENGTH OF FUNDAMENTAL

PSA-ESCI 2015.03.03  
EmiR5 2015.05.29

Work Order:	CCOM0015	Date:	07/08/15	
Project:	None	Temperature:	23.4 °C	
Job Site:	MN05	Humidity:	44.5% RH	
Serial Number:	9000000009	Barometric Pres.:	989.1 mbar	
EUT:		CD320 Commander Flex		
Configuration:	4			
Customer:	Cardiocom			
Attendees:	None			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmitting low channel and high channel			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.249:2015	ANSI C63.10:2009

Run #	12	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
2473.675	56.0	36.1	1.0	12.1	3.0	0.0	Vert	AV	0.0	92.1	94.0	-1.9	Low ch, EUT on side
2478.667	55.4	36.1	1.1	41.1	3.0	0.0	Vert	AV	0.0	91.5	94.0	-2.5	High ch, EUT on side
2473.683	55.3	36.1	1.2	19.1	3.0	0.0	Horz	AV	0.0	91.4	94.0	-2.6	Low ch, EUT horz
2478.700	53.3	36.1	1.2	22.1	3.0	0.0	Horz	AV	0.0	89.4	94.0	-4.6	High ch, EUT horz
2478.683	52.8	36.1	1.4	49.0	3.0	0.0	Vert	AV	0.0	88.9	94.0	-5.1	High ch, EUT horz
2478.700	51.5	36.1	1.0	236.9	3.0	0.0	Vert	AV	0.0	87.6	94.0	-6.4	High ch, EUT vert
2478.675	51.5	36.1	1.0	185.1	3.0	0.0	Horz	AV	0.0	87.6	94.0	-6.4	High ch, EUT vert
2478.667	50.0	36.1	1.0	167.1	3.0	0.0	Horz	AV	0.0	86.1	94.0	-7.9	High ch, EUT on side
2473.917	57.7	36.1	1.0	12.1	3.0	0.0	Vert	PK	0.0	93.8	114.0	-20.2	Low ch, EUT on side
2473.692	57.2	36.1	1.2	19.1	3.0	0.0	Horz	PK	0.0	93.3	114.0	-20.7	Low ch, EUT horz
2478.742	57.1	36.1	1.1	41.1	3.0	0.0	Vert	PK	0.0	93.2	114.0	-20.8	High ch, EUT on side
2478.500	55.2	36.1	1.2	22.1	3.0	0.0	Horz	PK	0.0	91.3	114.0	-22.7	High ch, EUT horz
2478.508	54.8	36.1	1.4	49.0	3.0	0.0	Vert	PK	0.0	90.9	114.0	-23.1	High ch, EUT horz
2478.708	53.5	36.1	1.0	185.1	3.0	0.0	Horz	PK	0.0	89.6	114.0	-24.4	High ch, EUT vert
2478.550	53.5	36.1	1.0	236.9	3.0	0.0	Vert	PK	0.0	89.6	114.0	-24.4	High ch, EUT vert
2478.525	52.2	36.1	1.0	167.1	3.0	0.0	Horz	PK	0.0	88.3	114.0	-25.7	High ch, EUT on side