FX ConnectX LLC

TEST REPORT FOR

Wireless Main 19" Rack Controller
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)
15.207 AND 15.249

Report No.: 94710-22

Date of issue: February 13, 2014

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

FX ConnectX LLC
1250 Avenida Acaso, Ste F
Camarillo, CA 93012

REPRESENTATIVE: David Nichols
Customer Reference Number: 190767

REPORT PREPARED BY:

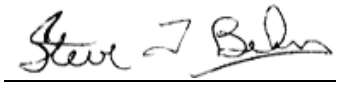
Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 94710

DATE OF EQUIPMENT RECEIPT: January 24, 2014
DATE(S) OF TESTING: January 24, 2014

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Bothell	US0081	SL2-IN-E-1145R	3082C-1	318736	A-0148

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Test Procedure/Method	Description	Results
15.207 / ANSI C63.4	Conducted Emissions	Pass
15.249(a) / 558074 DO1 DTS Measurement Guidance V01	Fundamental Field Strength	Pass
15.215(c)	Occupied Bandwidth	Pass
15.249(d) / 558074 DO1 DTS Measurement Guidance V01	Field Strength of Spurious Emissions & Band Edge	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
The Main 19" Rack Controller had the following characteristics that dictated testing: 1. -EUT is powered by 12VDC power adaptor. 2. -All audio ports are terminated with appropriate audio cables. 3. -Has option to be rack mounted or non-rack mounted.

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Wireless Main 19" Rack Controller
Manuf: Applied Wireless Inc.
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM
Serial: 5842C801V3R40214A01

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

DC Power Supply
Manuf: ULL Power
Model: SAW-1200500
Serial: None

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) CFR 47 Section 15 Subpart C requirements for Intentional Radiators.

15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:	**FX ConnectX LLC**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**94710**	Date:	1/21/2014
Test Type:	**Conducted Emissions**	Time:	10:53:41 AM
Equipment:	**Wireless Main 19" Rack Controller**	Sequence#:	4
Manufacturer:	Applied Wireless Inc.	Tested By:	Eddie Mariscal
Model:	STAGE PRO-8 WIRELESS CONTROL SYSTEM		120V 60Hz
S/N:	5842C801V3R40214A01		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014
T2	ANMACOND	Cable		8/17/2012	8/17/2014
T3	ANP06230	Cable	CXTA04A-50	8/16/2012	8/16/2014
T4	ANP05624	Attenuator	PE7010-10	8/13/2012	8/13/2014
T5	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	3/15/2013	3/15/2015
	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	3/15/2013	3/15/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Wireless Main 19" Rack Controller*	Applied Wireless Inc.	STAGE PRO-8 WIRELESS CONTROL SYSTEM	5842C801V3R40214A01

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	ULL Power	SAW-1200500	None

Test Conditions / Notes:

EUT is set atop wooden, nonconductive turntable of height 80cm. EUT is a simplex transceiver with transmit operating in the band 2400-2483MHz. During testing the EUT is in standby mode. All IO ports of the EUT are terminated with appropriate cables. EUT is powered by 12VDC power adaptor.

Frequency Range of Interest:
0.15-30MHz
RBW = 9kHz
VBW > 9kHz

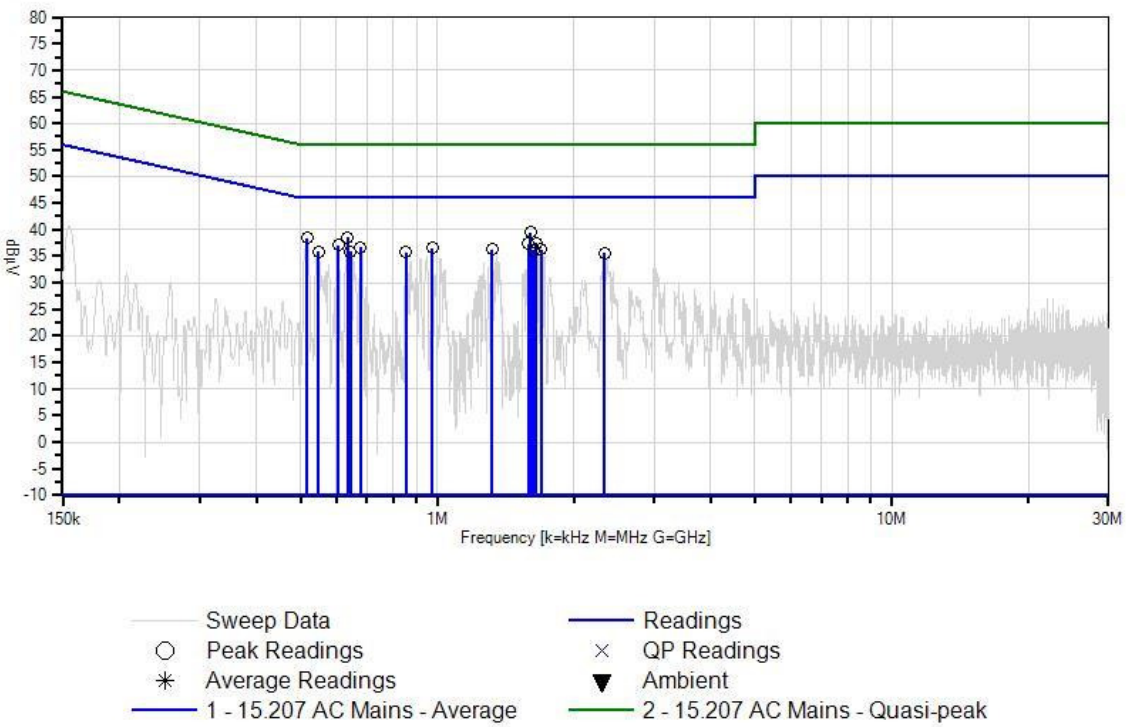
Environmental conditions:
Temperature: 19°C
Relative Humidity: 33%
Atmospheric Pressure: 98.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	1.602M	28.6	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	39.5	46.0	-6.5	Black
2	634.515k	27.5	+0.3 +0.4	+0.2	+0.1	+10.0	+0.0	38.5	46.0	-7.5	Black
3	518.162k	27.5	+0.2 +0.4	+0.2	+0.1	+10.0	+0.0	38.4	46.0	-7.6	Black
4	1.651M	26.6	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	37.5	46.0	-8.5	Black
5	1.587M	26.4	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	37.3	46.0	-8.7	Black
6	605.427k	26.2	+0.2 +0.4	+0.2	+0.1	+10.0	+0.0	37.1	46.0	-8.9	Black
7	678.147k	25.8	+0.2 +0.4	+0.2	+0.1	+10.0	+0.0	36.7	46.0	-9.3	Black
8	974.847k	25.6	+0.2 +0.3	+0.3	+0.1	+10.0	+0.0	36.5	46.0	-9.5	Black
9	1.322M	25.3	+0.2 +0.3	+0.4	+0.1	+10.0	+0.0	36.3	46.0	-9.7	Black
10	1.696M	25.4	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	36.3	46.0	-9.7	Black
11	1.625M	25.2	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	36.1	46.0	-9.9	Black
12	547.250k	25.0	+0.2 +0.4	+0.2	+0.1	+10.0	+0.0	35.9	46.0	-10.1	Black
13	644.696k	24.9	+0.3 +0.4	+0.2	+0.1	+10.0	+0.0	35.9	46.0	-10.1	Black
14	852.677k	24.9	+0.2 +0.3	+0.3	+0.1	+10.0	+0.0	35.8	46.0	-10.2	Black
15	2.333M	24.7	+0.1 +0.3	+0.5	+0.1	+9.9	+0.0	35.6	46.0	-10.4	Black

CKC Laboratories, Inc. Date: 1/21/2014 Time: 10:53:41 AM FX ConnectX LLC WO#: 94710
15.207 AC Mains - Quasi-peak Test Lead: Black 120V 60Hz Sequence#: 4 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **FX ConnectX LLC**
Specification: **15.207 AC Mains - Quasi-peak**
Work Order #: **94710** Date: 1/21/2014
Test Type: **Conducted Emissions** Time: 10:58:53 AM
Equipment: **Wireless Main 19" Rack Controller** Sequence#: 5
Manufacturer: Applied Wireless Inc. Tested By: Eddie Mariscal
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM 120V 60Hz
S/N: 5842C801V3R40214A01

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014
T2	ANMACOND	Cable		8/17/2012	8/17/2014
T3	ANP06230	Cable	CXTA04A-50	8/16/2012	8/16/2014
T4	ANP05624	Attenuator	PE7010-10	8/13/2012	8/13/2014
	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	3/15/2013	3/15/2015
T5	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	3/15/2013	3/15/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Wireless Main 19" Rack Controller*	Applied Wireless Inc.	STAGE PRO-8 WIRELESS CONTROL SYSTEM	5842C801V3R40214A01

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	ULL Power	SAW-1200500	None

Test Conditions / Notes:

EUT is set atop wooden, nonconductive turntable of height 80cm. EUT is a simplex transceiver with transmit operating in the band 2400-2483MHz. During testing the EUT is in standby mode. All IO ports of the EUT are terminated with appropriate cables. EUT is powered by 12VDC power adaptor.

Frequency Range of Interest:
0.15-30MHz
RBW = 9kHz
VBW > 9kHz

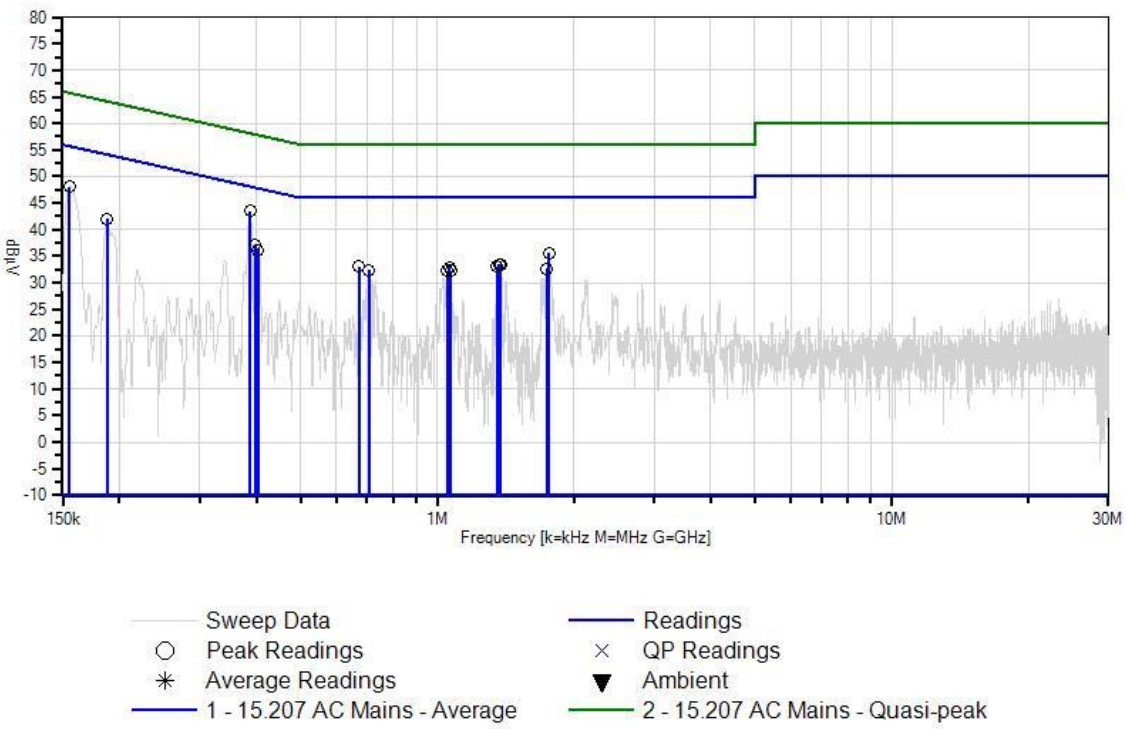
Environmental conditions:
Temperature: 19°C
Relative Humidity: 33%
Atmospheric Pressure: 98.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	387.265k	32.5	+0.2 +0.5	+0.2	+0.1	+10.0	+0.0	43.5	48.1	-4.6	White
2	155.400k	32.9	+3.6 +1.5	+0.1	+0.0	+10.0	+0.0	48.1	55.7	-7.6	White
3	1.763M	24.7	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	35.6	46.0	-10.4	White
4	397.446k	26.2	+0.2 +0.5	+0.2	+0.1	+10.0	+0.0	37.2	47.9	-10.7	White
5	403.263k	25.2	+0.2 +0.5	+0.2	+0.1	+10.0	+0.0	36.2	47.8	-11.6	White
6	187.650k	30.4	+0.3 +1.2	+0.1	+0.0	+10.0	+0.0	42.0	54.1	-12.1	White
7	1.368M	22.5	+0.2 +0.3	+0.4	+0.1	+10.0	+0.0	33.5	46.0	-12.5	White
8	1.379M	22.4	+0.2 +0.3	+0.4	+0.1	+10.0	+0.0	33.4	46.0	-12.6	White
9	673.784k	22.2	+0.2 +0.4	+0.2	+0.1	+10.0	+0.0	33.1	46.0	-12.9	White
10	1.353M	22.1	+0.2 +0.3	+0.4	+0.1	+10.0	+0.0	33.1	46.0	-12.9	White
11	1.065M	22.0	+0.2 +0.3	+0.3	+0.1	+10.0	+0.0	32.9	46.0	-13.1	White
12	1.746M	21.7	+0.2 +0.3	+0.4	+0.1	+9.9	+0.0	32.6	46.0	-13.4	White
13	708.690k	21.4	+0.2 +0.4	+0.3	+0.1	+10.0	+0.0	32.4	46.0	-13.6	White
14	1.052M	21.3	+0.2 +0.3	+0.3	+0.1	+10.0	+0.0	32.2	46.0	-13.8	White
15	1.072M	21.3	+0.2 +0.3	+0.3	+0.1	+10.0	+0.0	32.2	46.0	-13.8	White

CKC Laboratories, Inc. Date: 1/21/2014 Time: 10:58:53 AM FX ConnectX LLC WO#: 94710
15.207 AC Mains - Quasi-peak Test Lead: White 120V 60Hz Sequence#: 5 Ext ATTN: 0 dB



Test Setup Photo(s)

15.249(a) Fundamental Field Strength

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **FX ConnectX LLC**
Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
Work Order #: **94710** Date: 1/24/2014
Test Type: **Maximized Emissions** Time: 10:57:25
Equipment: **Wireless Main 19" Rack Controller** Sequence#: 1
Manufacturer: Applied Wireless Inc. Tested By: Eddie Mariscal
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM
S/N: 5842C801V3R40214A01

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	4/13/2012	4/13/2014
T2	AN03355	Cable	32026-2-29094K-48TC	2/7/2013	2/7/2015
T3	AN03155	Preamp	83017A	6/26/2013	6/26/2015
T4	ANP05904	Cable	32022-2-29094K-144TC	2/15/2013	2/15/2015
T5	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T6	AN03359	Cable		2/4/2013	2/4/2015
T7	AN03358	Cable	32022-2-29094K-36TC	2/7/2013	2/7/2015
T8	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Wireless Main 19" Rack Controller*	Applied Wireless Inc.	STAGE PRO-8 WIRELESS CONTROL SYSTEM	5842C801V3R40214A01

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	ULL Power	SAW-1200500	None

Test Conditions / Notes:

EUT is set atop Styrofoam supports on a wooden, nonconductive turntable at a height of 1.5m. EUT is a simplex transceiver operating within the band 2400-2483MHz. EUT is powered via AC-DC power adaptor. EUT is in constant transmit mode.

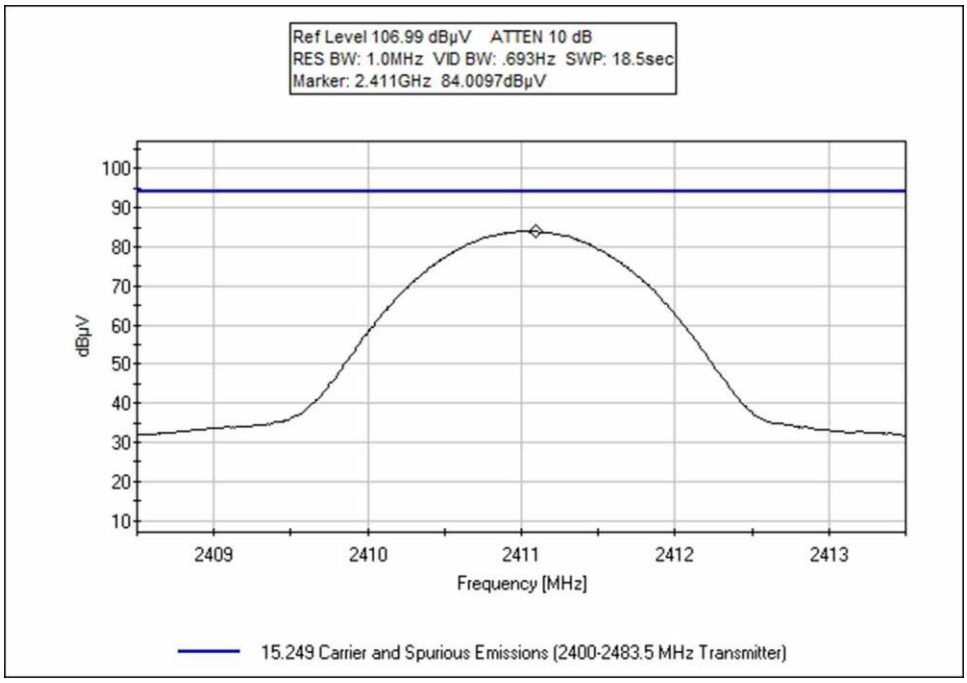
Per 15.31(e), the Voltage was varied from 85% to 115% on the AC-DC power adaptor and no change in power was noted.
Frequency of Interest: Fundamental
RBW = 1MHz
VBW > 1MHz

Environmental conditions:
Temperature: 19°C
Relative Humidity: 33%
Atmospheric Pressure: 98.7kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2444.000M	84.4	+28.6	+0.5	-32.9	+2.2	+0.0	84.7	94.0	-9.3	Vert
	Ave		+0.7	+0.6	+0.6	+0.0					
2	2481.042M	83.8	+28.7	+0.5	-32.9	+2.3	+0.0	84.3	94.0	-9.7	Vert
	Ave		+0.7	+0.6	+0.6	+0.0					
3	2411.000M	84.1	+28.5	+0.5	-32.9	+2.2	+0.0	84.2	94.0	-9.8	Vert
	Ave		+0.7	+0.6	+0.5	+0.0					
4	2481.000M	77.3	+28.7	+0.5	-32.9	+2.3	+0.0	77.8	94.0	-16.2	Horiz
	Ave		+0.7	+0.6	+0.6	+0.0					
5	2411.000M	74.7	+28.5	+0.5	-32.9	+2.2	+0.0	74.8	94.0	-19.2	Horiz
	Ave		+0.7	+0.6	+0.5	+0.0					
6	2444.000M	74.4	+28.6	+0.5	-32.9	+2.2	+0.0	74.7	94.0	-19.3	Horiz
	Ave		+0.7	+0.6	+0.6	+0.0					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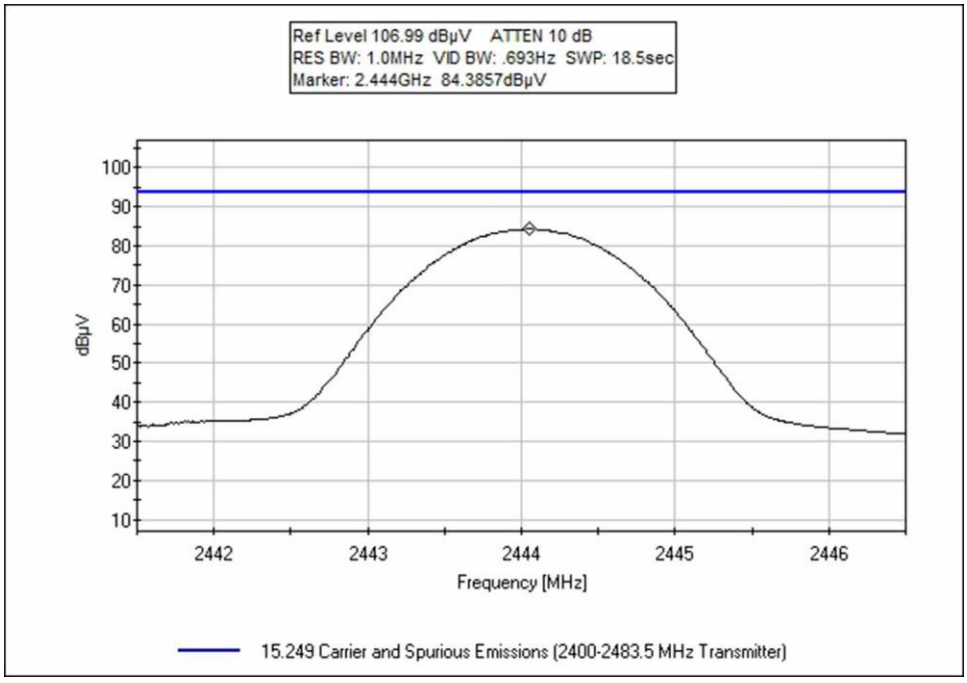
RES BW: 1.0MHz VID BW: .693Hz SWP: 18.5sec
Marker: 2.411GHz 84.0097dBµV
dBµV
100
90
80
70
60
50
40
30
20
10
2409
2410
2411
2412
2413
Frequency [MHz]
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)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Marker: 2.444GHz 84.3857dBµV
dBµV
100
90
80
70
60
50
40
30
20
10
2442
2443
2444
2445
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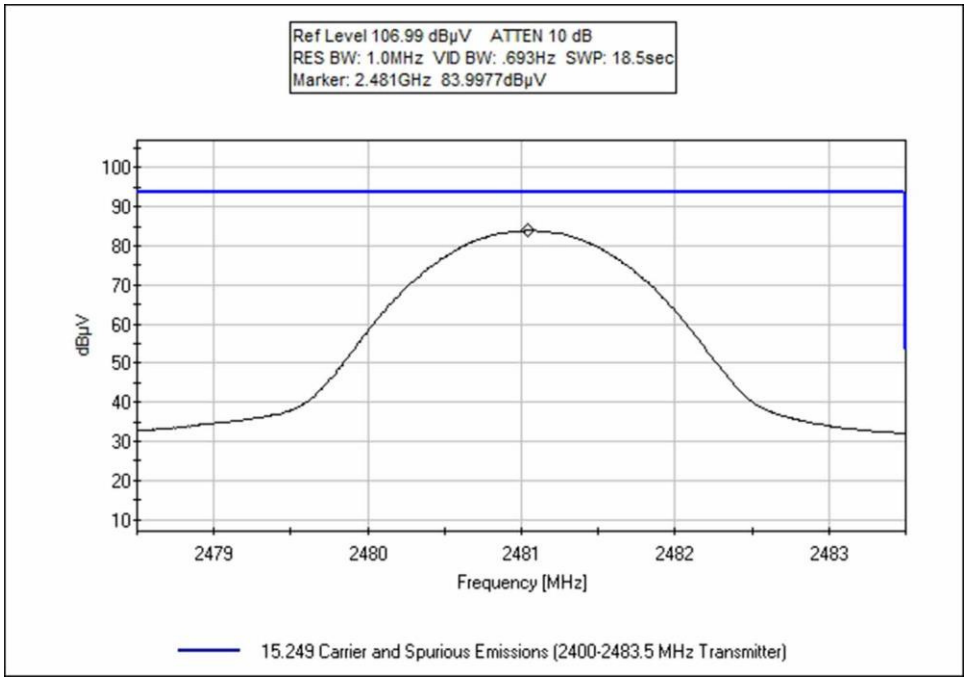
Frequency [MHz]
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)


Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: .693Hz SWP: 18.5sec
Marker: 2.481GHz 83.9977dBµV
100
90
80
70
60
50
40
30
20
10
dBµV
2479
2480
2481
2482
2483
Frequency [MHz]
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

Test Setup Photo(s)

15.215(c) Occupied Bandwidth

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **FX ConnectX LLC**
Specification: **15.215 (c) 20dB bandwidth**
Work Order #: **94710** Date: 1/24/2014
Test Type: **Maximized Emissions** Time: 10:57:25
Equipment: **Wireless Main 19" Rack Controller** Sequence#: 1
Manufacturer: Applied Wireless Inc Tested By: Eddie Mariscal
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM
S/N: 5842C801V3R40214A01

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	4/13/2012	4/13/2014
T2	AN03355	Cable	32026-2-29094K-48TC	2/7/2013	2/7/2015
T3	AN03155	Preamp	83017A	6/26/2013	6/26/2015
T4	ANP05904	Cable	32022-2-29094K-144TC	2/15/2013	2/15/2015
T5	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T6	AN03359	Cable		2/4/2013	2/4/2015
T7	AN03358	Cable	32022-2-29094K-36TC	2/7/2013	2/7/2015
T8	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Wireless Main 19" Rack Controller*	Applied Wireless Inc	STAGE PRO-8 WIRELESS CONTROL SYSTEM	5842C801V3R40214A01

Support Devices:

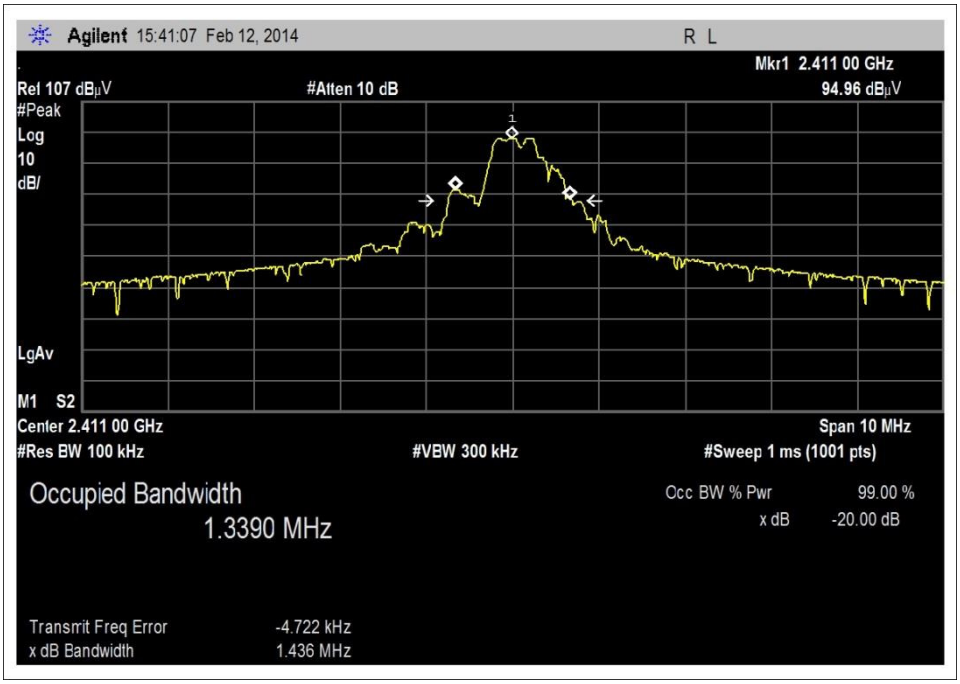
Function	Manufacturer	Model #	S/N
DC Power Supply	ULL Power	SAW-1200500	None

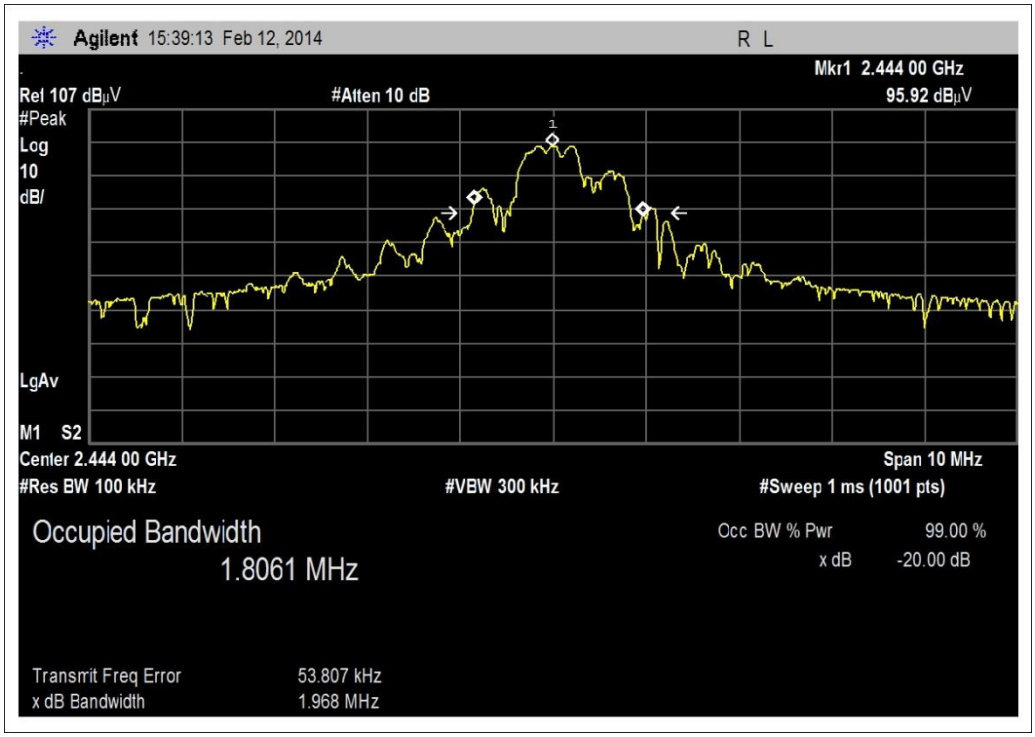
Test Conditions / Notes:

EUT is set atop Styrofoam supports on a wooden, nonconductive turntable at a height of 1.5m. EUT is a simplex transceiver operating within the band 2400-2483MHz. EUT is powered via AC-DC power adaptor. EUT is in constant transmit mode.

Frequency of Interest: Fundamental
RBW = 100kHz
VBW = 300kHz

Environmental conditions:
Temperature: 19°C
Relative Humidity: 33%
Atmospheric Pressure: 98.7kPa

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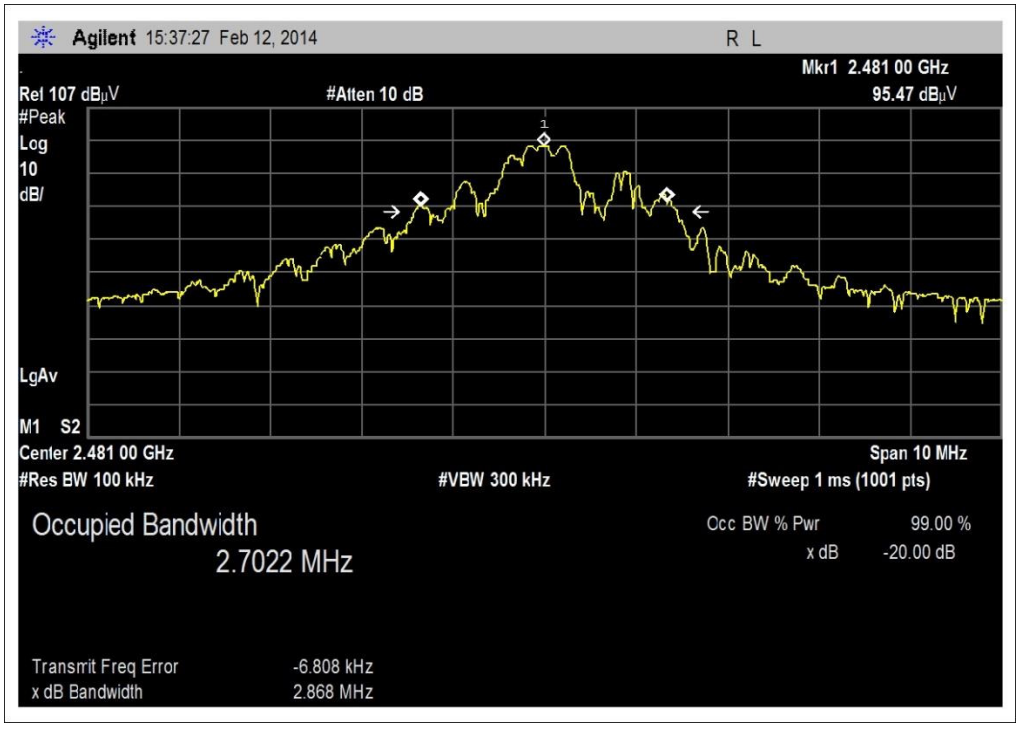
Mkr1 2.444 00 GHz
Ref 107 dBµV
#Atten 10 dB
95.92 dBµV
#Peak
Log
10
dB/
LgAv
M1 S2
Center 2.444 00 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 1 ms (1001 pts)
Occupied Bandwidth
1.8061 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 53.807 kHz
x dB Bandwidth 1.968 MHz


Agilent 15:37:27 Feb 12, 2014
R L
Mkr1 2.481 00 GHz
Ref 107 dBµV
#Atten 10 dB
95.47 dBµV
#Peak
Log
10
dB/
LgAv
M1 S2
Center 2.481 00 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 1 ms (1001 pts)
Occupied Bandwidth
2.7022 MHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -6.808 kHz
x dB Bandwidth 2.868 MHz

Test Setup Photo(s)

15.249(d) Field Strength of Spurious Emissions & Band Edge

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **FX ConnectX LLC**
Specification: **15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)**
Work Order #: **94710** Date: 1/24/2014
Test Type: **Maximized Emissions** Time: 15:30:00
Equipment: **Wireless Main 19" Rack Controller** Sequence#: 1
Manufacturer: Applied Wireless Inc. Tested By: Eddie Mariscal
Model: STAGE PRO-8 WIRELESS CONTROL SYSTEM
S/N: 5842C801V3R40214A01

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	4/13/2012	4/13/2014
	AN02046	Horn Antenna-ANSI C63,5 (2006) 3m (dB)	MWH-1826/B	2/4/2013	2/4/2015
T2	AN03355	Cable	32026-2-29094K-48TC	2/7/2013	2/7/2015
T3	AN03155	Preamp	83017A	6/26/2013	6/26/2015
T4	ANP05904	Cable	32022-2-29094K-144TC	2/15/2013	2/15/2015
T5	AN03360	Cable	32022-2-29094-36TC	2/4/2013	2/4/2015
T6	AN03359	Cable		2/4/2013	2/4/2015
T7	AN03358	Cable	32022-2-29094K-36TC	2/7/2013	2/7/2015
T8	AN02660	Spectrum Analyzer	E4446A	8/23/2012	8/23/2014
T9	AN00226	Loop Antenna	6502	3/28/2012	3/28/2014
T10	ANP06230	Cable	CXTA04A-50	8/16/2012	8/16/2014
	AN00062	Preamp	8447D	6/6/2012	6/6/2014
	AN01991	Biconilog Antenna	CBL6111C	3/14/2012	3/14/2014
	ANP05922	Cable	RG/214	8/15/2012	8/15/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Wireless Main 19" Rack Controller*	Applied Wireless Inc.	STAGE PRO-8 WIRELESS CONTROL SYSTEM	5842C801V3R40214A01

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	ULL Power	SAW-1200500	None

Test Conditions / Notes:

EUT is set atop Styrofoam supports on a wooden, nonconductive turntable at a height of 1.5m. EUT is a simplex

transceiver operating within the band 2400-2483MHz. EUT is powered via 12VDC power adaptor. EUT is in constant transmit mode.

Frequency range of Interest: 9kHz-25GHz
9-150kHz: RBW = 200Hz; VBW > 200Hz
0.15-30MHz: RBW = 9kHz; VBW > 9kHz
30-1000MHz: RBW = 120kHz; VBW > 120kHz
1-25GHz: RBW = 1MHz; VBW > 1MHz

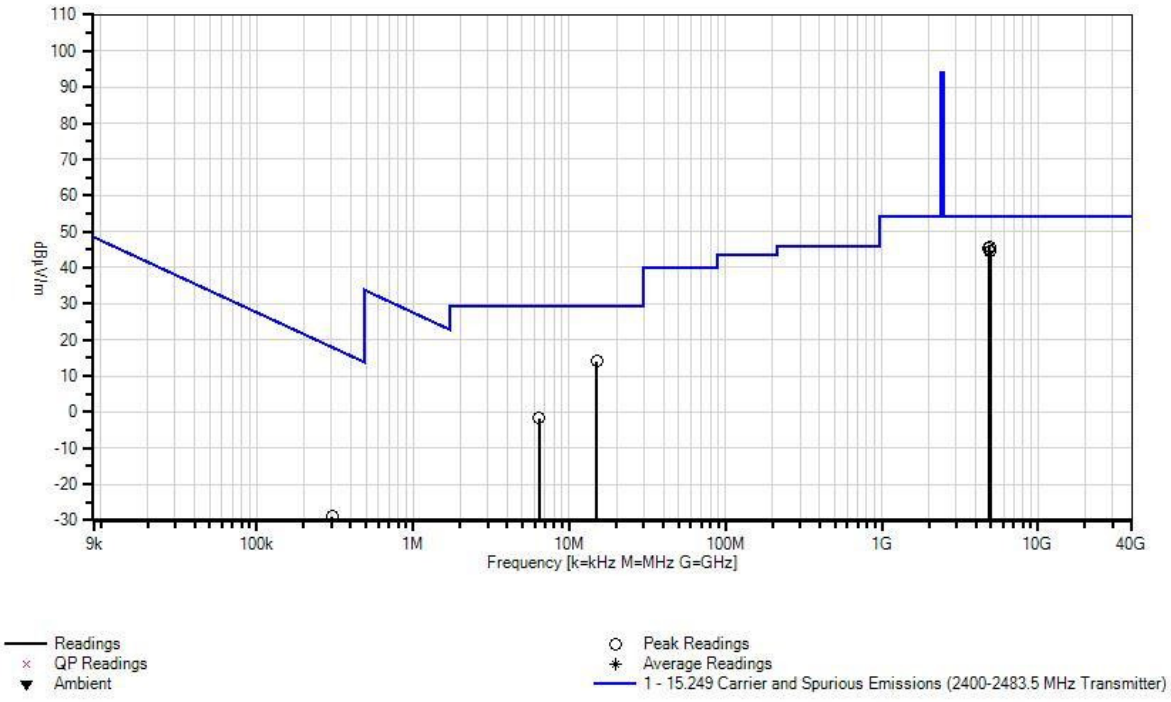
Environmental conditions:
Temperature: 19°C
Relative Humidity: 33%
Atmospheric Pressure: 98.7kPa

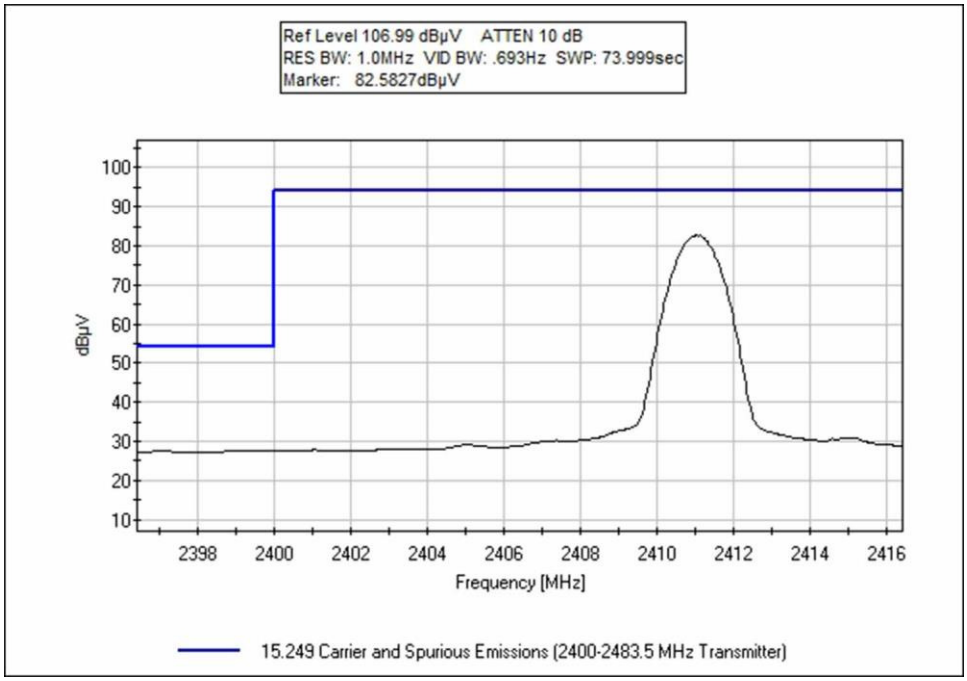
Ext Attn: 0 dB

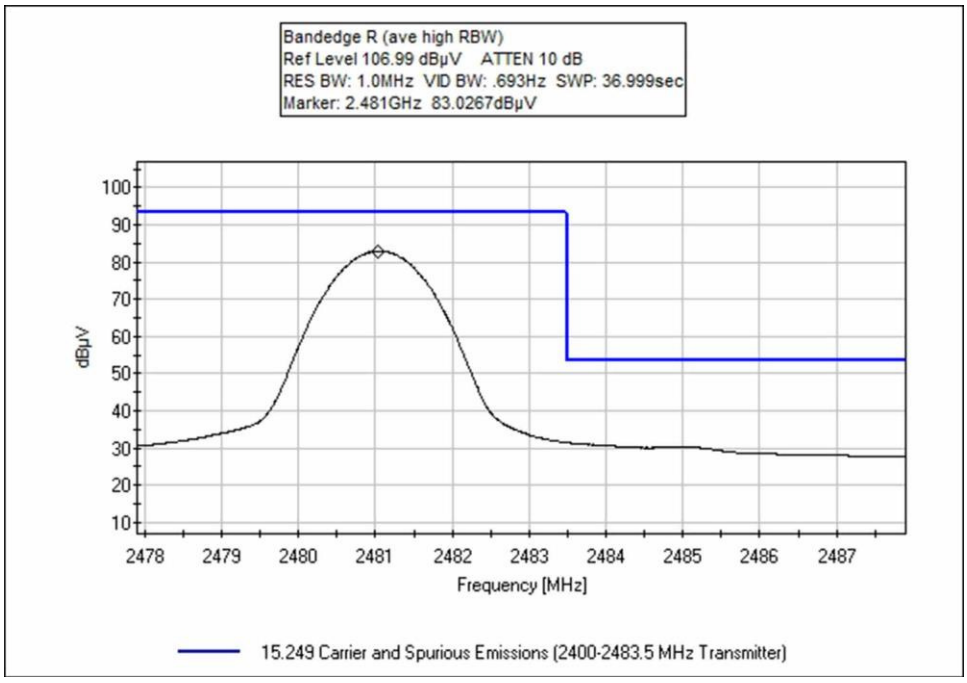
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4888.083M	40.1	+31.6 +1.0 +0.0	+0.8 +0.8 +0.0	-32.9 +1.2	+3.2 +0.0	+0.0	45.8	54.0	-8.2	Vert
2	4822.008M	39.7	+31.6 +0.9 +0.0	+0.8 +0.9 +0.0	-33.0 +1.2	+3.2 +0.0	+0.0	45.3	54.0	-8.7	Vert
3	4962.050M	39.0	+31.5 +1.0 +0.0	+0.8 +0.8 +0.0	-33.0 +1.2	+3.3 +0.0	+0.0	44.6	54.0	-9.4	Horiz
4	15.000M	44.2	+0.0 +0.0 +9.5	+0.0 +0.0 +0.4	+0.0 +0.0	+0.0 +0.0	-40.0	14.1	29.5	-15.4	Vert
5	6.402M	28.0	+0.0 +0.0 +9.9	+0.0 +0.0 +0.3	+0.0 +0.0	+0.0 +0.0	-40.0	-1.8	29.5	-31.3	Vert
6	304.500k	41.3	+0.0 +0.0 +9.8	+0.0 +0.0 +0.0	+0.0 +0.0	+0.0 +0.0	-80.0	-28.9	17.9	-46.8	Vert

CKC Laboratories, Inc. Date: 1/24/2014 Time: 15:30:00 FX ConnectX LLC WO#: 94710
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter) Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB




Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: .693Hz SWP: 73.999sec
Marker: 82.5827dBµV
dBµV
100
90
80
70
60
50
40
30
20
10
2398
2400
2402
2404
2406
2408
2410
2412
2414
2416
Frequency [MHz]
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

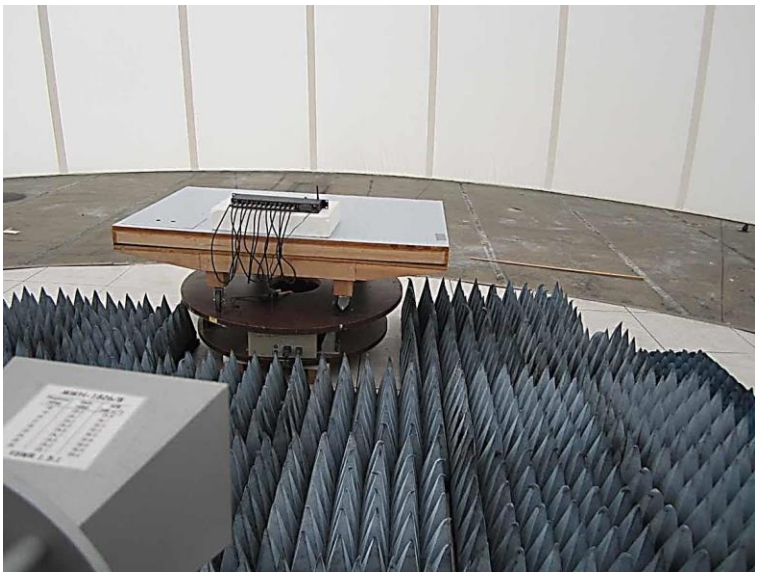

Bandedge R (ave high RBW)
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: .693Hz SWP: 36.999sec
Marker: 2.481GHz 83.0267dBµV
dBµV
100
90
80
70
60
50
40
30
20
10
2478
2479
2480
2481
2482
2483
2484
2485
2486
2487
Frequency [MHz]
15.249 Carrier and Spurious Emissions (2400-2483.5 MHz Transmitter)

Test Setup Photo(s)

Low

Middle

High



High

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.