WaveLynx Technologies Corporation

TEST REPORT FOR

ET10-7

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.209

Report No.: 100602-28

Date of issue: January 18, 2018

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.

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

WaveLynx Technologies Corporation
100 Technology Drive, Suite B150
Broomfield, CO 80021

Representative: Daniel Field
Customer Reference Number: CKPO111017

REPORT PREPARED BY:

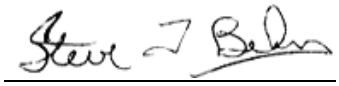
Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 100602

DATE OF EQUIPMENT RECEIPT: December 13, 2017
DATE(S) OF TESTING: December 13 - 15, 2017

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.
5046 Sierra Pines Drive
Mariposa, CA 95338

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.02
EMITest Emissions	5.03.11

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Mariposa D, CA	US0103	SL2-IN-E-1147R	3082A-1	US1024	A-0136

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.209

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.209	Field Strength of Fundamental	NA	Pass
15.209	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
ET25-7	WaveLynx	ET25-7	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
Power Supply	HP	8721A	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Modulation Type(s):	CW
Antenna Type(s) and Gain:	Loop
Antenna Connection Type:	Integral
Nominal Input Voltage:	12VDC
Firmware / Software used for Test:	WR220

FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

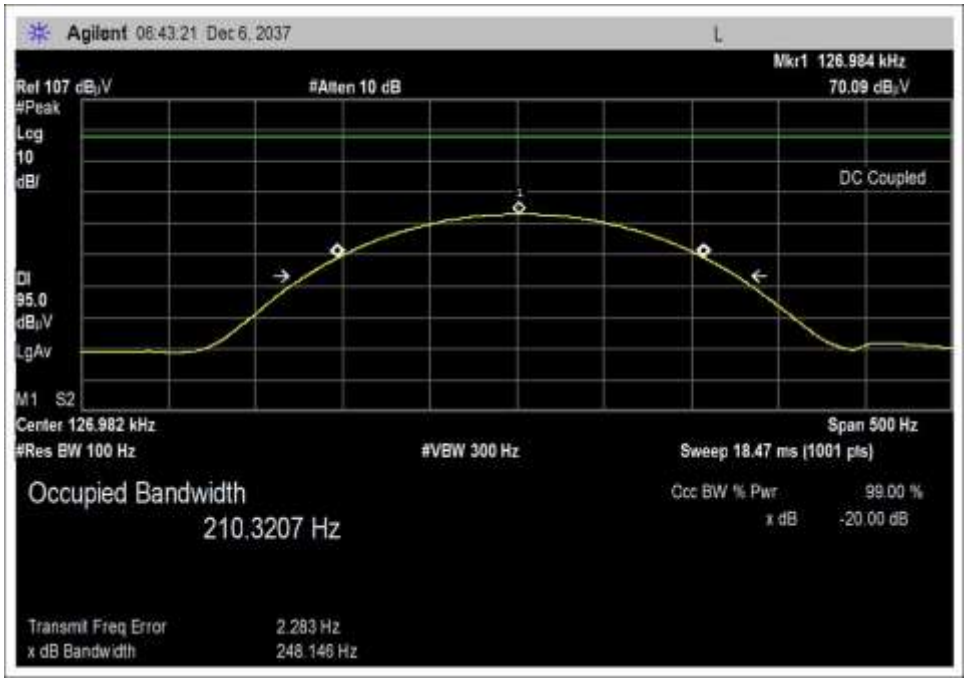
Test Setup/Conditions			
Test Location:	Mariposa Lab D	Test Engineer:	Michael Rauch Jr.
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/13/2017
Configuration:	1		
Test Setup:	Equipment is powered via DC power supply and configured for continuous operation on 125kHz.		

Environmental Conditions			
Temperature (ºC)	16	Relative Humidity (%):	63

Test Equipment					
Asset# / Serial#	Description	Manufacturer	Model	Cal Date	Cal Due
00226	Loop Antenna	EMCO	6502	4/4/2016	4/4/2018
P06229	Cable	Andrew	CXTA04A-50	11/29/2016	11/29/2018
P07059	Cable	Andrew	CNT-195-FR-3	11/8/2016	11/8/2018
03634	Spectrum Analyzer	Agilent	E4445A	8/30/2017	8/30/2018
MD3M	Cable	NA	NA	3/17/2016	3/17/2018

Test Data Summary				
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)
0.125	1	CW	0.248	None

Plot(s)


Agilent 06:43:21 Dec 6, 2037
Mkr1 126.984 kHz
70.09 dBµV
Ref 107 dBµV
#Atten 10 dB
#Peak
Log
10
dB/
DC Coupled
Cl
95.0
dBµV
LgAv
M1 S2
Center 126.982 kHz
Span 500 Hz
#Res BW 100 Hz
#VBW 300 Hz
Sweep 18.47 ms (1001 pts)
Occupied Bandwidth
210.3207 Hz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 2.283 Hz
x dB Bandwidth 248.146 Hz

Test Setup Photo(s)

15.209 Field Strength of Fundamental

Test Setup/Conditions			
Test Location:	Mariposa Lab D	Test Engineer:	Michael Rauch Jr.
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/13/2017
Configuration:	1		
Test Setup	Equipment is powered via DC power supply and configured for continuous operation on 125kHz.		

Test Data Summary - Voltage Variations					
Frequency (MHz)	**Modulation / Ant Port**	**$V_{Minimum}$ (dBuV/m)**	**$V_{Nominal}$ (dBuV/m)**	**$V_{Maximum}$ (dBuV/m)**	**Max Deviation from $V_{Nominal}$ (dB)**
0.125	CW / Integral	-6.9	-2.1	-7.0	4.9

Test performed using operational mode with the highest output power, representing worst case.

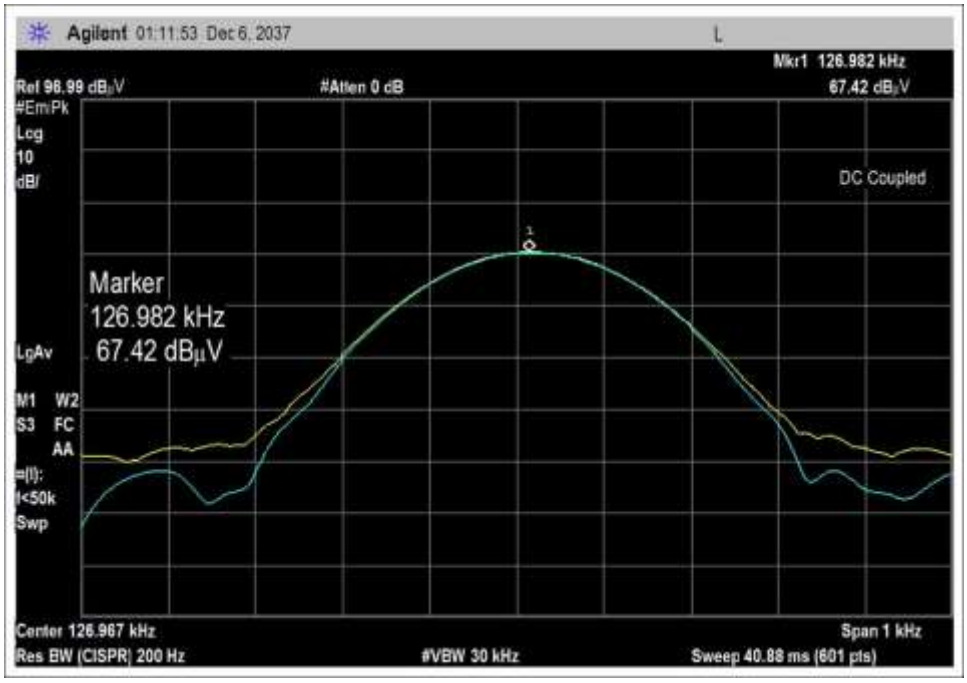
Parameter Definitions:

Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value	
$V_{Nominal}$:	120 VAC	
$V_{Minimum}$:	102.00 VAC	
$V_{Maximum}$:	138.00 VAC	

Test Data Summary – Radiated Field Strength Measurement					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Measured (dBuV/m @ 3m)**	**Limit (dBuV/m @ 3m)**	**Results**
0.125	CW	Integral	-2.1	≤25.5	Pass

Plot Data


Agilent 01:11:53 Dec 6, 2037
Mkr1 126.982 kHz
67.42 dBµV
Ref 98.99 dBµV
#Atten 0 dB
#Ext/Pk
Log
10
dB/
DC Coupled
Marker
126.982 kHz
67.42 dBµV
LgAv
M1 W2
S3 FC
AA
#(I):
I<50k
Swp
Center 126.967 kHz
Span 1 kHz
Res BW (CISPR) 200 Hz
#VBW 30 kHz
Sweep 40.88 ms (601 pts)

Test Data

Test Location:	CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240		
Customer:	**WaveLynx Technologies Corporation.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**100602**	Date:	12/13/2017
Test Type:	**Maximized Emissions**	Time:	10:42:51
Tested By:	Michael Rauch Jr.	Sequence#:	1
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Radiated Emissions Spurious Measurements (125kHz)

Temperature: 12.2°C
Humidity:60%
Atmospheric Pressure: 97.8kPa

Method: ANSI C63.10 (2013)

Modulation: CW
Antenna Type: Integral

The EUT is powered by a DC power supply at 12VDC. The customer declares a typical configuration will be wall mounted in an upright/vertical (Y-axis) orientation.
The EUT is setup on an 80cm foam block. It has been programmed to continuously transmit the RFID signal at 125kHz.

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
T1	ANMD3M	Cable		3/17/2016	3/17/2018
T2	ANP07059	Cable	CNT-195-FR-3	11/8/2016	11/8/2018
	AN03634	Spectrum Analyzer	E4445A	8/30/2017	8/30/2018
	ANP06229	Cable-Amplitude 15 to 45degC (dB)	CXTA04A-50	11/29/2016	11/29/2018
T3	ANP06229	Cable-Amplitude - 15 to 15degC	CXTA04A-50	11/29/2016	11/29/2018
T4	AN00226	Loop Antenna	6502	4/4/2016	4/4/2018

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	126.983k	67.4	+0.0	+0.0	+0.0	+10.5	-80.0 104	-2.1	25.5 12VDC	-27.6	Paral 100
2	126.963k	62.6	+0.0	+0.0	+0.0	+10.5	-80.0 103	-6.9	25.5 10.8VDC	-32.4	Paral 100
3	126.963k	62.5	+0.0	+0.0	+0.0	+10.5	-80.0 103	-7.0	25.5 13.8VDC	-32.5	Paral 100
4	126.968k	57.6	+0.0	+0.0	+0.0	+10.5	-80.0 141	-11.9	25.5 13.8VDC	-37.4	Perpe 100
5	126.953k	57.4	+0.0	+0.0	+0.0	+10.5	-80.0 135	-12.1	25.5 10.8VDC	-37.6	Perpe 100
6	126.973k	56.7	+0.0	+0.0	+0.0	+10.5	-80.0 133	-12.8	25.5 12VDC	-38.3	Perpe 100
7	126.973k	41.6	+0.0	+0.0	+0.0	+10.5	-80.0 6	-27.9	25.5 12VDC	-53.4	Z-Axi 100
8	126.993k	41.5	+0.0	+0.0	+0.0	+10.5	-80.0 6	-28.0	25.5 10.8VDC	-53.5	Z-Axi 100
9	126.953k	41.0	+0.0	+0.0	+0.0	+10.5	-80.0 6	-28.5	25.5 13.8VDC	-54.0	Z-Axi 100

Test Setup Photo(s)

15.209 Radiated Emissions

Test Data

Test Location:	CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240		
Customer:	**WaveLynx Technologies Corporation.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**100602**	Date:	12/13/2017
Test Type:	**Maximized Emissions**	Time:	17:44:53
Tested By:	Randal Clark	Sequence#:	6
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

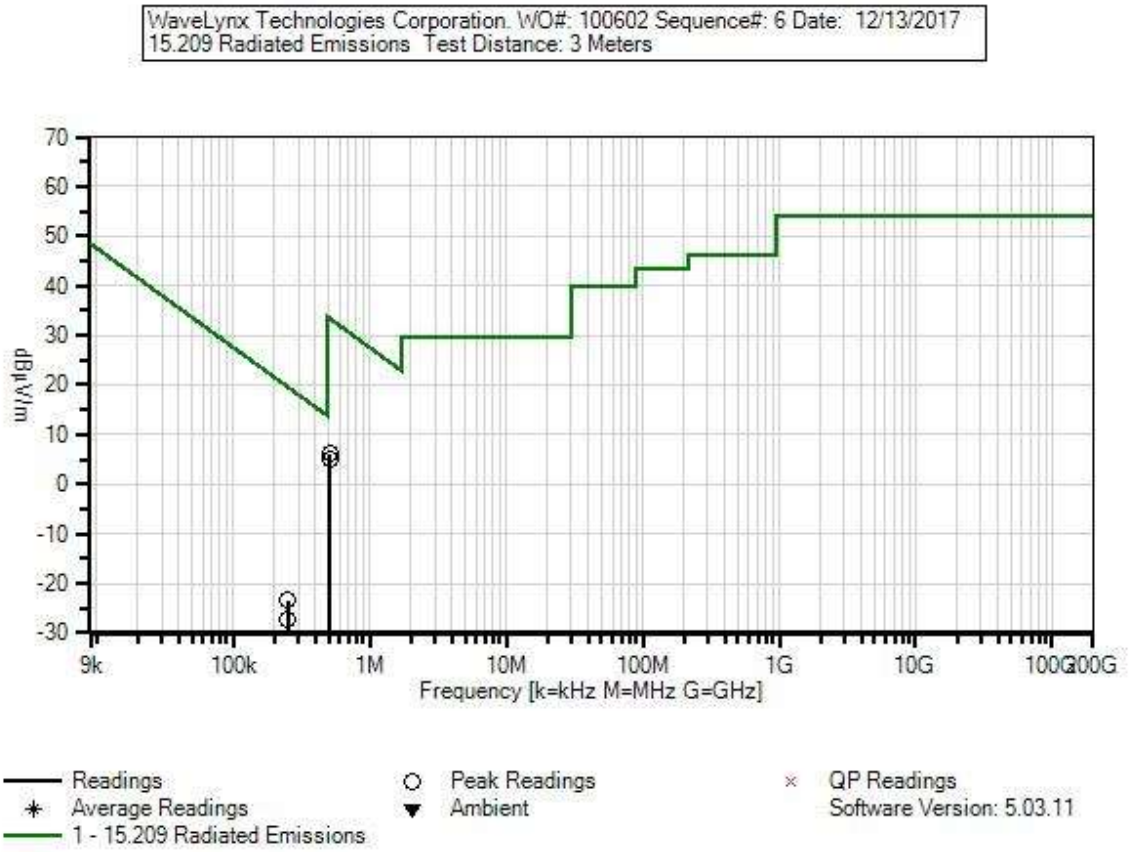
Radiated Emissions Spurious Measurements (125kHz)

Temperature: 16°C
Humidity: 63%
Atmospheric Pressure: 97.8 kPa

Method: ANSI C63.10 (2013)

Modulation: CW
Antenna Type: Integral

The EUT is powered by a DC power supply at 12VDC. The customer declares a typical configuration will be wall mounted in an upright/vertical (Y-axis) orientation.
The EUT is setup on an 80cm foam block. It has been programmed to continuously transmit the RFID signal at 125kHz.
Frequency range tested: 9kHz – 30MHz


WaveLynx Technologies Corporation. WO#: 100602 Sequence#: 6 Date: 12/13/2017
15.209 Radiated Emissions Test Distance: 3 Meters
70
60
50
40
30
20
10
0
-10
-20
-30
dBµV/m
9k
100k
1M
10M
100M
1G
10G
100G
200G
Frequency [k=kHz M=MHz G=GHz]
Readings
Average Readings
1 - 15.209 Radiated Emissions
Peak Readings
Ambient
QP Readings
Software Version: 5.03.11

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
T1	ANMD3M	Cable		3/17/2016	3/17/2018
T2	ANP07059	Cable	CNT-195-FR-3	11/8/2016	11/8/2018
	AN03634	Spectrum Analyzer	E4445A	8/30/2017	8/30/2018
T3	ANP06229	Cable-Amplitude 15 to 45degC (dB)	CXTA04A-50	11/29/2016	11/29/2018
	ANP06229	Cable-Amplitude - 15 to 15degC	CXTA04A-50	11/29/2016	11/29/2018
T4	AN00226	Loop Antenna	6502	4/4/2016	4/4/2018
	ANdBuA	Unit Conversion		7/20/2016	7/20/2018

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	507.880k	36.1	+0.1	+0.0	+0.1	+9.7	-40.0	6.0	33.5	-27.5	Parra
									Ambient noise floor		
2	507.880k	35.1	+0.1	+0.0	+0.1	+9.7	-40.0	5.0	33.5	-28.5	Perpe
									Ambient noise floor		
3	253.940k	46.6	+0.1	+0.0	+0.0	+9.9	-80.0	-23.4	19.5	-42.9	Parra
4	253.940k	42.8	+0.1	+0.0	+0.0	+9.9	-80.0	-27.2	19.5	-46.7	Perpe
5	380.910k	38.6	+0.1	+0.0	+0.1	+9.8	-80.0	-31.4	16.0	-47.4	Parra
									Ambient noise floor		
6	380.910k	38.0	+0.1	+0.0	+0.1	+9.8	-80.0	-32.0	16.0	-48.0	Perpe
									Ambient noise floor		

Test Location:	CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240		
Customer:	**WaveLynx Technologies Corporation.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**100602**	Date:	12/14/2017
Test Type:	**Maximized Emissions**	Time:	15:43:17
Tested By:	Randal Clark	Sequence#:	16
Software:	EMITest 5.03.11		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Radiated Emissions Spurious Measurements (125kHz)

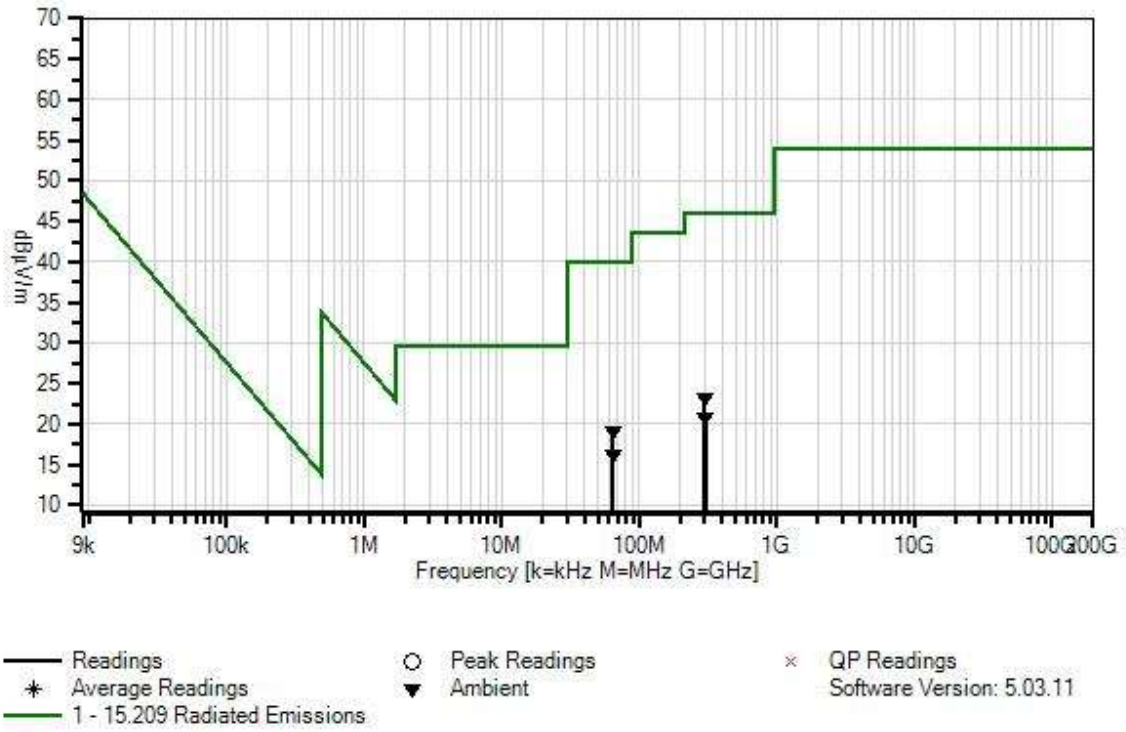
Temperature: 18°C
Humidity:27%
Atmospheric Pressure: 97.8kPa

Modulation: CW
Antenna Type: Integral

The EUT is powered by a DC power supply at 12VDC. The customer declares a typical configuration will be wall mounted in an upright/vertical (Y-axis) orientation.
The EUT is setup on an 80cm foam block. It has been programmed to continuously transmit the RFID signal at 125kHz.

No EUT emissions detected within 20dB of the limit.
Frequency range tested: 30-1000MHz

WaveLynx Technologies Corporation. WO#: 100602 Sequence#: 16 Date: 12/14/2017
15.209 Radiated Emissions Test Distance: 3 Meters



Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	AN03634	Spectrum Analyzer	E4445A	8/30/2017	8/30/2018
T1	AN00282	Preamp	8447D	4/7/2016	4/7/2018
T2	AN01993	Biconilog Antenna	CBL6111C	11/1/2016	11/1/2018
T3	ANP05656	Attenuator	PE7004-6	12/22/2015	12/22/2017
T4	ANMD3M	Cable		3/17/2016	3/17/2018
T5	ANP07059	Cable	CNT-195-FR-3	11/8/2016	11/8/2018
T6	ANP06229	Cable-Amplitude 15 to 45degC (dB)	CXTA04A-50	11/29/2016	11/29/2018
	ANP06229	Cable-Amplitude - 15 to 15degC	CXTA04A-50	11/29/2016	11/29/2018
T7	ANP06885	Cable	P06885	9/6/2017	9/6/2019

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

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	64.000M	32.9	-27.8	+6.0	+6.0	+0.9	+0.0	19.1	40.0	-20.9	Vert
	Ambient		+0.1	+0.8	+0.2						
2	300.000M	26.5	-27.0	+13.4	+6.0	+1.9	+0.0	23.3	46.0	-22.7	Vert
	Ambient		+0.2	+1.9	+0.4						
3	64.000M	30.0	-27.8	+6.0	+6.0	+0.9	+0.0	16.2	40.0	-23.8	Horiz
	Ambient		+0.1	+0.8	+0.2						
4	304.000M	23.9	-27.0	+13.5	+6.0	+1.9	+0.0	20.9	46.0	-25.1	Horiz
	Ambient		+0.2	+2.0	+0.4						

Test Setup Photo(s)

15.207 AC Conducted Emissions

Test Data

Test Location:	CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240		
Customer:	**WaveLynx Technologies Corporation.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**100602**	Date:	12/15/2017
Test Type:	**Conducted Emissions**	Time:	1:58:22 PM
Tested By:	Randal Clark	Sequence#:	22
Software:	EMITest 5.03.11		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

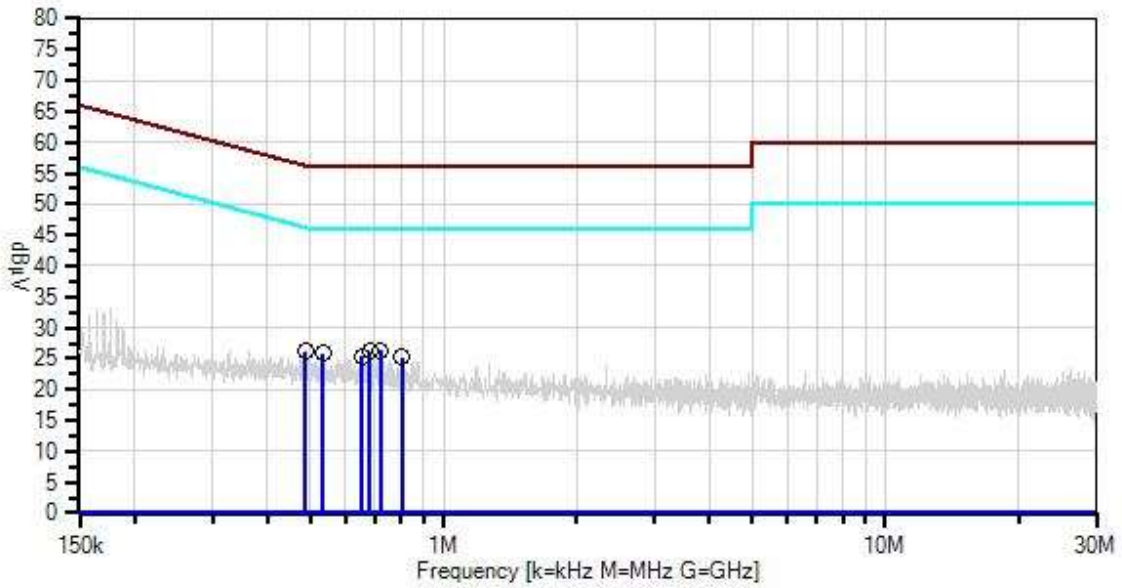
Conducted Emissions Measurements (125kHz)

Temperature: 17°C
Humidity:51%
Atmospheric Pressure: 97.8kPa

Method: ANSI C63.10 (2013)

The EUT is powered by a DC power supply at 12VDC. The customer declares a typical configuration will be wall mounted in an upright/vertical (Y-axis) orientation.
Equipment has been programmed to continuously transmit the RFID signal at 125kHz.

WaveLynx Technologies Corporation. WO#: 100602 Sequence#: 22 Date: 12/15/2017
15.207 AC Mains - Average Test Lead: 120V 60Hz Line



Sweep Data
× QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	AN03634	Spectrum Analyzer	E4445A	8/30/2017	8/30/2018
T1	ANP05624	Attenuator	PE7010-10	1/15/2017	1/15/2019
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	2/16/2016	2/16/2018
T3	ANP06229	Cable-Amplitude 15 to 45degC (dB)	CXTA04A-50	11/29/2016	11/29/2018
T4	ANMD3M	Cable		3/17/2016	3/17/2018
T5	AN01248	50uH LISN-Line (L1) (dB)	8028-50-TS-24-BNC	1/12/2017	1/12/2018
	AN01248	50uH LISN-Return (L2) (dB)	8028-50-TS-24-BNC	1/12/2017	1/12/2018

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	721.583k	15.7	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	26.4	46.0	-19.6	Line
2	679.405k	15.4	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	26.1	46.0	-19.9	Line
3	486.696k	15.6	+10.0 +0.1	+0.3	+0.1	+0.1	+0.0	26.2	46.2	-20.0	Line
4	533.964k	15.1	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	25.8	46.0	-20.2	Line
5	653.953k	14.7	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	25.4	46.0	-20.6	Line
6	804.485k	14.5	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	25.2	46.0	-20.8	Line

Test Location:	CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240		
Customer:	**WaveLynx Technologies Corporation.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**100602**	Date:	12/15/2017
Test Type:	**Conducted Emissions**	Time:	2:06:33 PM
Tested By:	Randal Clark	Sequence#:	23
Software:	EMITest 5.03.11		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

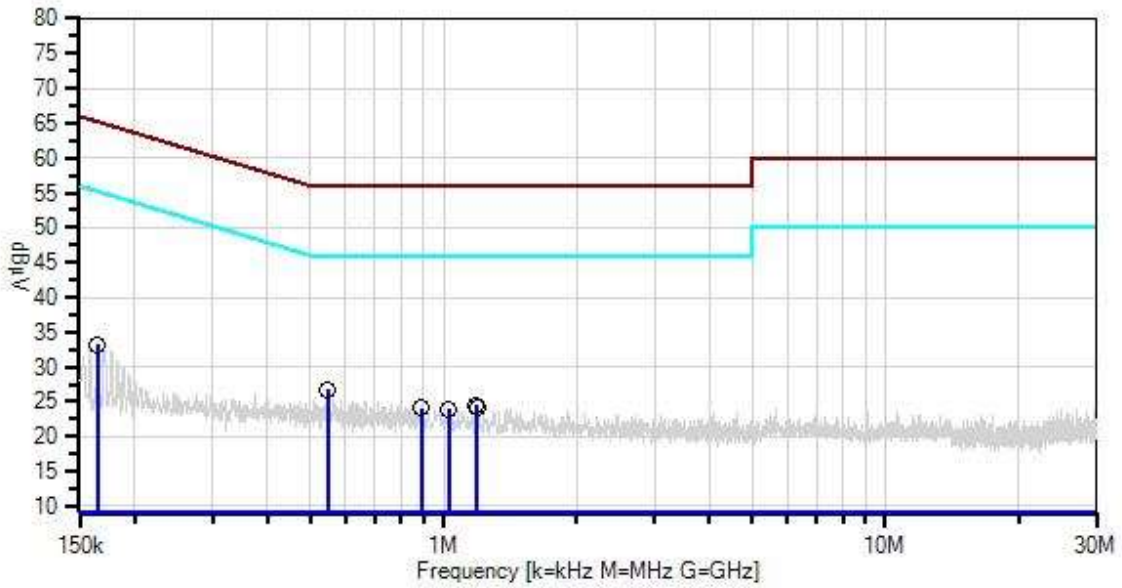
Conducted Emissions Measurements (125kHz)

Temperature: 17°C
Humidity:51%
Atmospheric Pressure: 97.8kPa

Method: ANSI C63.10 (2013)

The EUT is powered by a DC power supply at 12VDC. The customer declares a typical configuration will be wall mounted in an upright/vertical (Y-axis) orientation.
Equipment has been programmed to continuously transmit the RFID signal at 125kHz.

WaveLynx Technologies Corporation. WO#: 100602 Sequence#: 23 Date: 12/15/2017
15.207 AC Mains - Average Test Lead: 120V 60Hz Return



Sweep Data
× QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
	AN03634	Spectrum Analyzer	E4445A	8/30/2017	8/30/2018
T1	ANP05624	Attenuator	PE7010-10	1/15/2017	1/15/2019
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	2/16/2016	2/16/2018
T3	ANP06229	Cable-Amplitude 15 to 45degC (dB)	CXTA04A-50	11/29/2016	11/29/2018
T4	ANMD3M	Cable		3/17/2016	3/17/2018
	AN01248	50uH LISN-Line (L1) (dB)	8028-50-TS-24-BNC	1/12/2017	1/12/2018
T5	AN01248	50uH LISN-Return (L2) (dB)	8028-50-TS-24-BNC	1/12/2017	1/12/2018

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	547.054k	16.0	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	26.7	46.0	-19.3	Retur
2	1.183M	13.9	+10.0 +0.1	+0.3	+0.1	+0.1	+0.0	24.5	46.0	-21.5	Retur
3	1.192M	13.5	+10.0 +0.1	+0.3	+0.1	+0.1	+0.0	24.1	46.0	-21.9	Retur
4	889.963k	13.4	+10.0 +0.1	+0.4	+0.1	+0.1	+0.0	24.1	46.0	-21.9	Retur
5	164.544k	22.5	+10.0 +0.1	+0.6	+0.0	+0.0	+0.0	33.2	55.2	-22.0	Retur
6	1.030M	13.4	+10.0 +0.1	+0.3	+0.1	+0.1	+0.0	24.0	46.0	-22.0	Retur

Test Setup Photo(s)

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

Uncertainties reported are worst case for all CKC Laboratories' sites and 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. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	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 caret (“^”) 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.