TEST REPORT

Report Number: 101723139MIN-001
Project Number: G101723139

Testing performed on the
UltaMIST System
FCC ID: 2ACOI-CP-80033

to
47 CFR Part 15. 225:2013
RSS- 210, Issue 8, 2010
RSS-Gen, Issue 3, 2010

For
Celleration, Inc.

Test Performed by:
Intertek Testing Services NA, Inc.
7250 Hudson Blvd., Suite 100
Oakdale, MN 55128 USA

Test Authorized by:
Cellaration, Inc.
6321 Bury Dr.
Suite 15
Eden Prairie, MN 55346, USA

Prepared by: Richard Blonigen Date: July 8, 2014

Reviewed by: S Khazon Date: July 8, 2014
Simon Khazon

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1.0 GENERAL DESCRIPTION

Model:	UltraMIST System
Type of EUT:	Ultrasound Healing Therapy System
Serial Number:	REF CP-80033
FCC ID:	2ACOI-CP-80033
Related Submittal(s) Grants:	None
Company:	Celleration
Customer:	Ryan Tetzloff
Address:	6321 Bury Dr. Suite 15 Eden Prairie, MN 55346, USA
Phone:	(952) 224-8706
e-mail:	rtetzloff@celleration.com
Test Standards:	☒ 47 CFR, Part 15:2013, §15.225 ☒ RSS–210, Issue 8, 20010 ☒ RSS-Gen, Issue 3, 2010 ☐ 47 CFR, Part 15:2013, §15.107 and §15.109, Class ☒ ICES-003, Issue 5:2012 ☐ Other
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	July 1, 2014
Test Work Started:	July 1, 2014
Test Work Completed:	July 8, 2014
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	RF ID Transmitter
Operating Frequency	13.56MHz
Modulation:	ASK
Emission Designator:	2K7A1D
Antenna(s) Info:	Integral antenna
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ External power source ☒ 100 - 250VAC ☐ 230VAC ☐ 400VAC ☒ 50-60Hz ☐ 60Hz
Special Test Arrangement:	As a hand-held device the EUT was rotated through three orthogonal axes to determine and tested with the maximum emissions
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2009

1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

☐ - Standby
☒ - Continuous
☐ - Continuous un-modulated
☐ - Test program (customer specific)
☐ -

Operating modes of the EUT:

No.	Description
1	The Transmitter was set to transmit continuously to communicate with passive RF Tag. For AC mains Conducted Emissions testing the transmitter RF output was terminated.

Cables:

No.	Type	Length	Designation	Note
1	Unshielded	1.8m	Controller cable	

Support equipment/Services:

No.	Item	Description
1	Celleration Controller	Host Unit

1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

☒ **Normal**

Temperature: 15-35°C

Humidity: 30-60%

Atmospheric pressure: 86-106kPa

☒ **Extreme**

Temperature: -20 to +55°C

Primary Supply Voltage: ± 15%

1.4 Measurement uncertainty

The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be: ±4 dB at 10m and ±5.4 dB at 3m

The expanded uncertainty (k = 2) for conducted emissions from 150 kHz to 30 MHz has been determined to be:
±2.6 dB

1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.
The basic equation with a sample calculation is as follows:
FS = RA + AF + CF - AG

Where: FS = Field Strength in dB(µV/m)
RA = Receiver Amplitude in dB(µV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(m^{-1})
AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(µV) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(µV/m).

RA = 48.1 dB(µV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(µV/m)

General notes: None

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.225(a)(b)(c) / RSS-210 A2.6(a)(b)(c)	Field strength within the band of operation	Pass
15.225(d) / RSS-210 A2.6(d)	Out of band emissions	Pass
15.215(c) / RSS- Gen 4.6.1	Bandwidth of the emission	Pass
15.225(e) / RSS-210 A2.6	Frequency tolerance	Pass
15.207/RSS-Gen 7.2.2	AC mains conducted emissions	Pass

3.0 TEST CONDITIONS AND RESULTS

3.1 Field strength within the band of operation

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

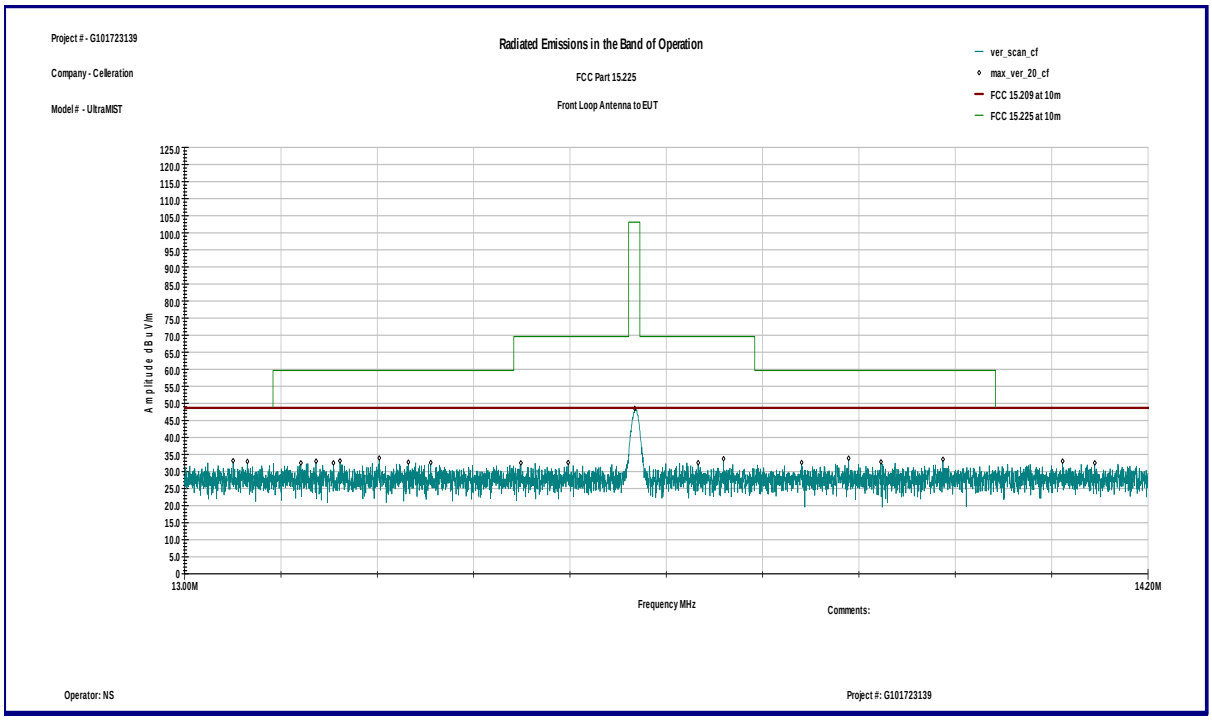
Test result: **Pass**

Notes:

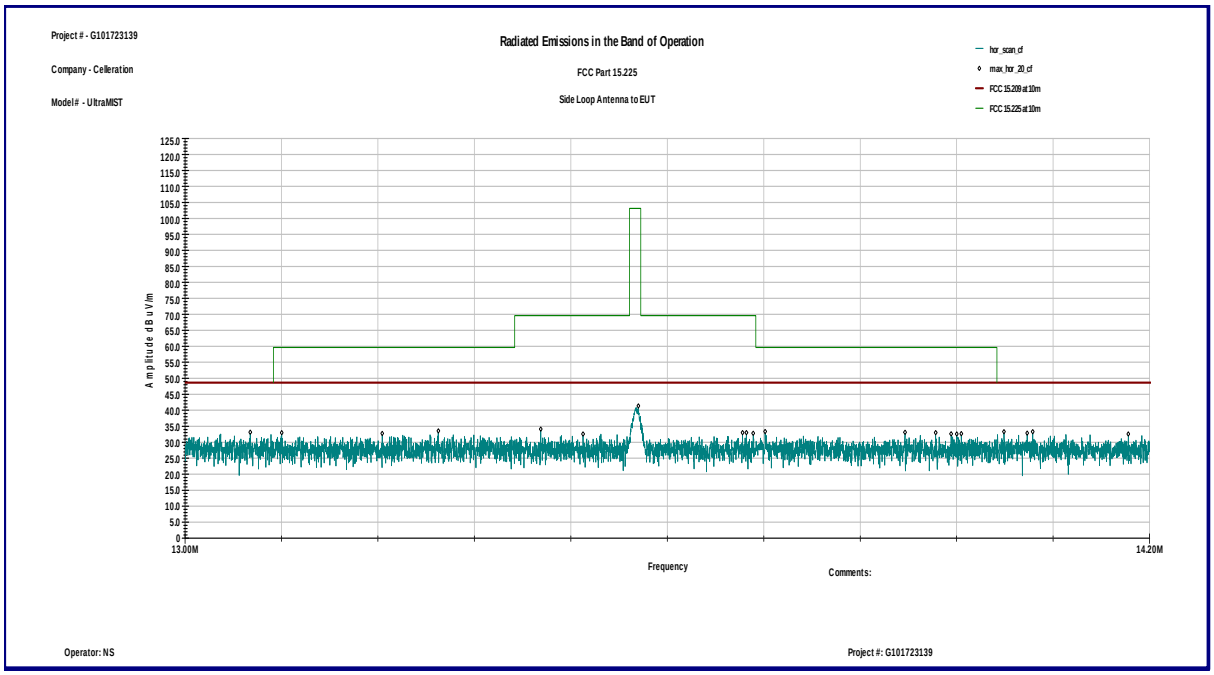
1. The peak readings at 3m measurement were below the 10m limits, therefore testing at 10m measurement distance was considered unnecessary (see Graph 3.1.1 & 3.1.2).
2. The peak reading of the fundamental frequency was below the FCC Part 15.209 limit, therefore Quasi-peak readings were not measured (see Graph 3.1.1 & 3.1.2)

Graph 3.1.1

Front antenna orientation



Side antenna orientation



3.2 Field strength outside of the band of operation

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

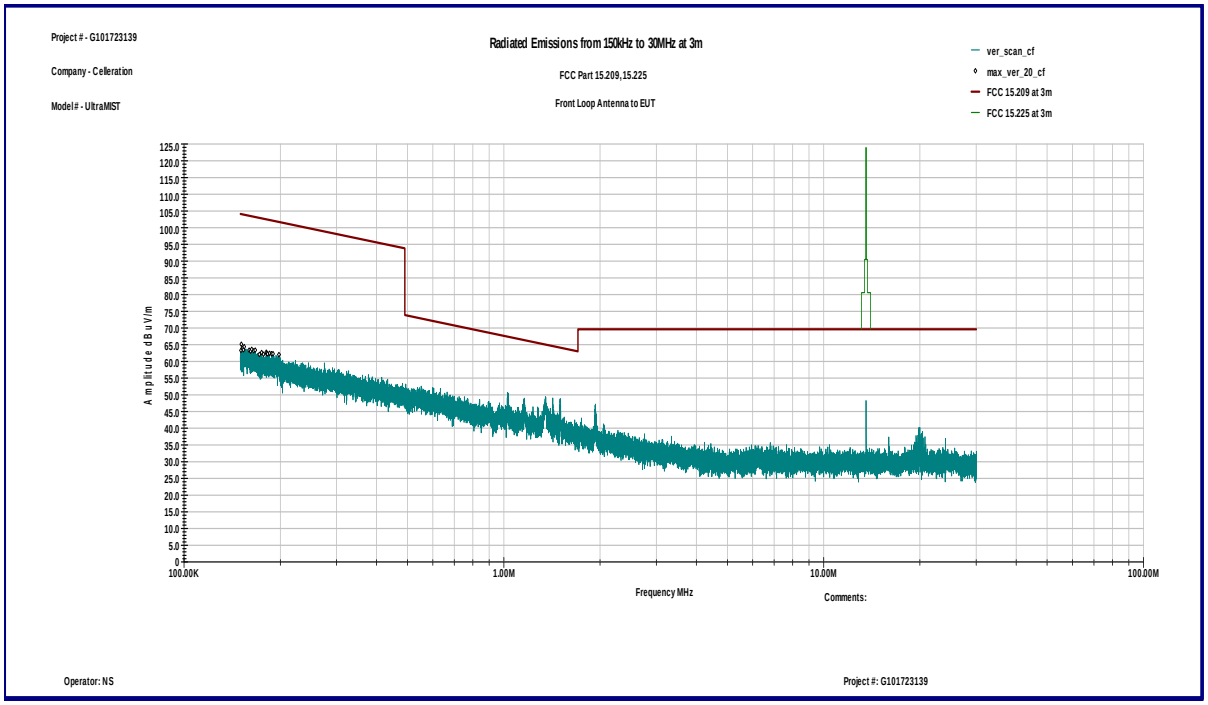
Frequency range of measurements: 0.15MHz-1000MHz

Test result: **Pass**

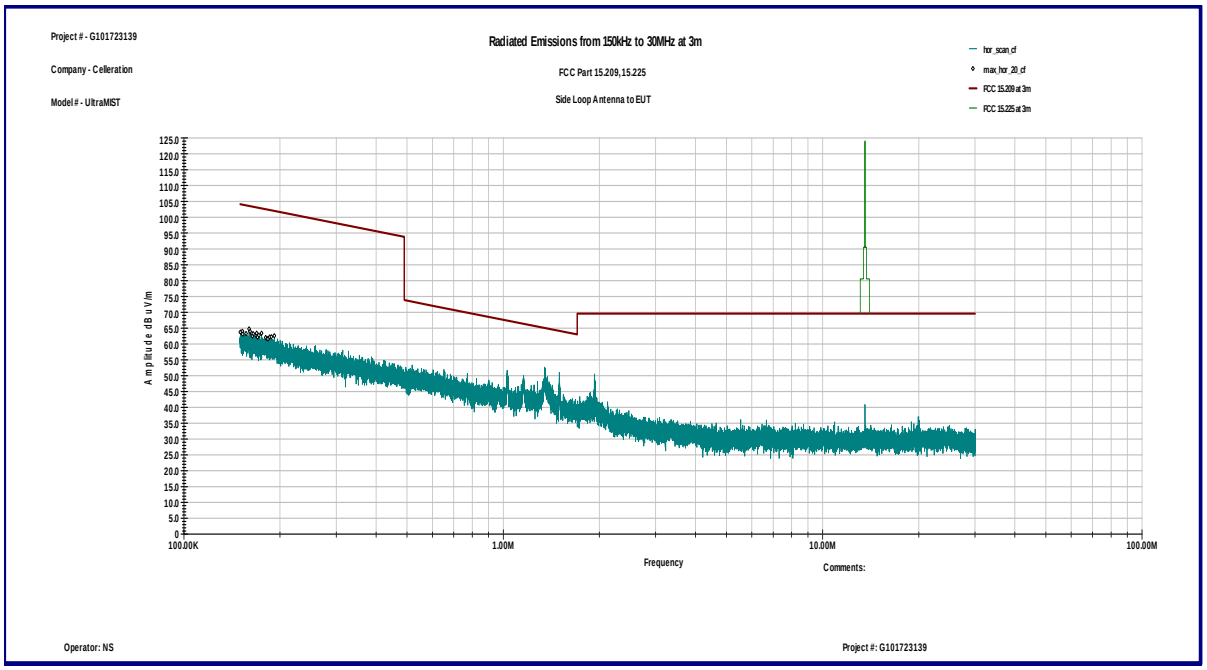
Notes: No emissions above ambient related to the transmitter were detected, excluding the fundamental frequency. The fundamental frequency was omitted from testing.

Graph 3.2.1

Front antenna orientation

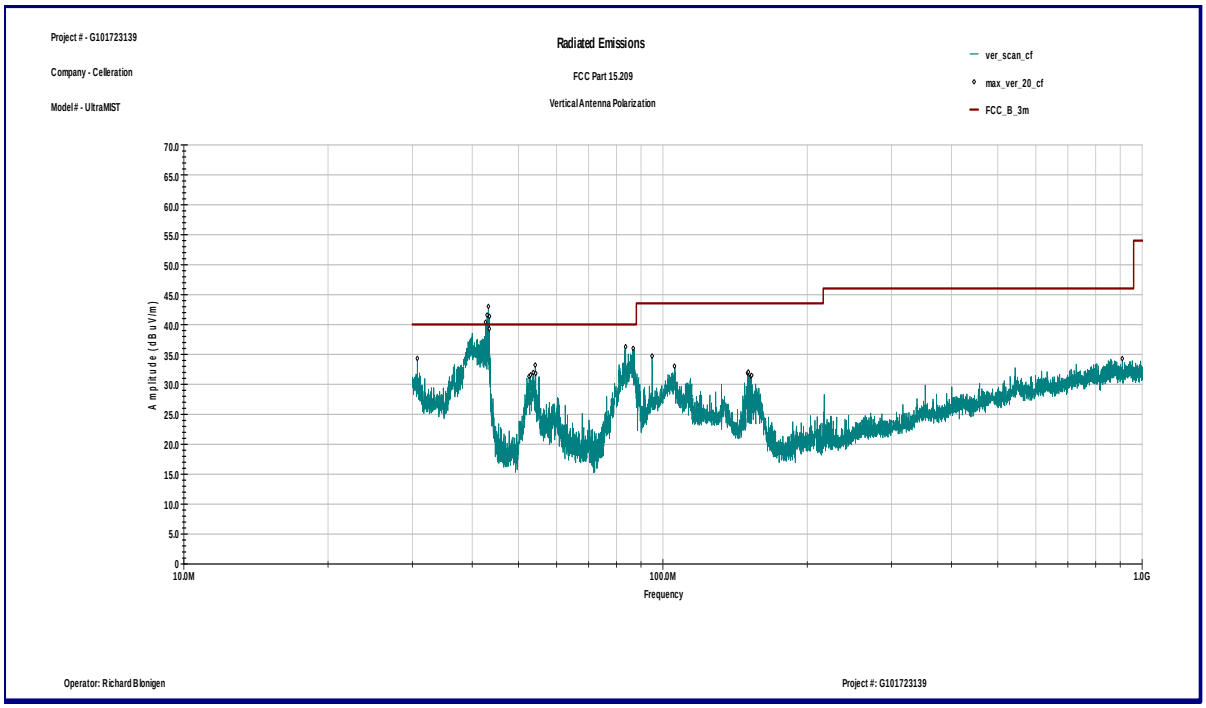


Side antenna orientation

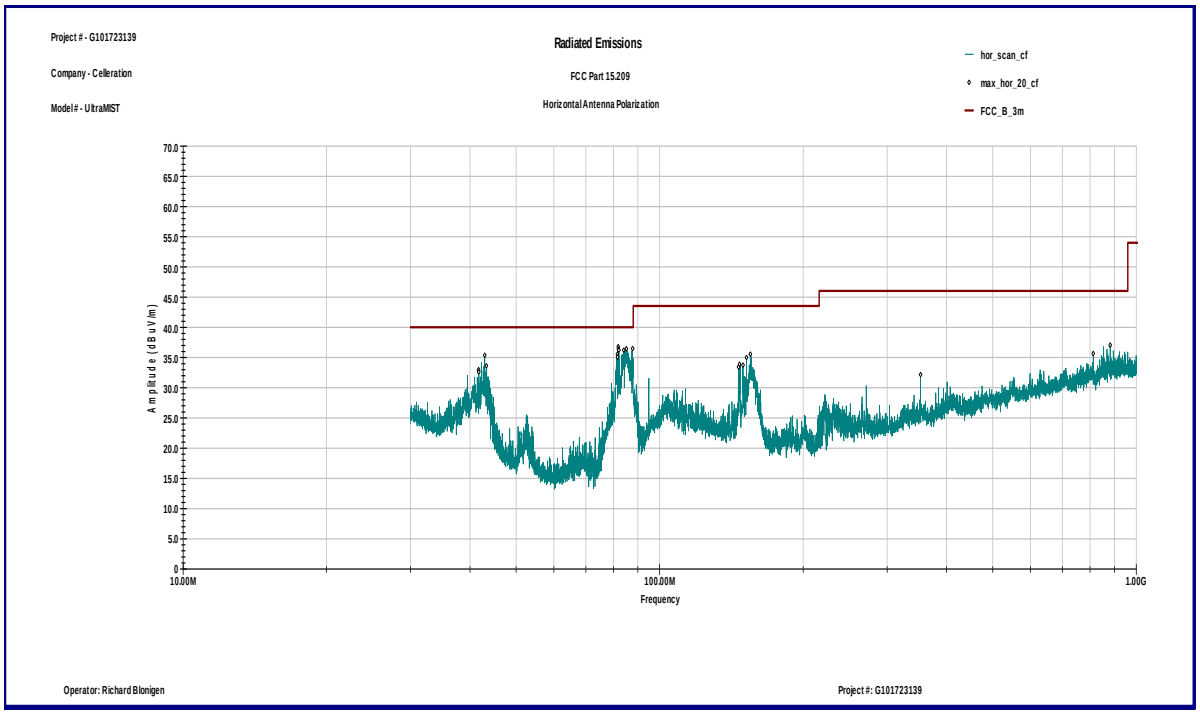


Graph 3.2.2

Vertical antenna polarization



Horizontal antenna polarization



3.3 Frequency Tolerance

Test location: ☐ OATS ☐ Anechoic Chamber ☒ Other

Test date: July 2, 2014

Tested by: Richard Blonigen

Test result: **Pass**

Test Parameter		Measured Deviation (Hz)	Maximum Allowed Deviation (Hz)	Test Results
Temperature °C	Voltage V			
-20	120	114	1356	**Pass**
-10		129	1356	**Pass**
0		112	1356	**Pass**
10		70	1356	**Pass**
20		0	1356	**Pass**
35		22.4	1356	**Pass**
55		-22.4	1356	**Pass**
20	102	0	1356	**Pass**
	108	0	1356	**Pass**
	114	0	1356	**Pass**
	120	0	1356	**Pass**
	126	0	1356	**Pass**
	132	0	1356	**Pass**
	138	0	1356	**Pass**

Notes: None

3.4 Bandwidth of Emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☒ Other

Test distance: ☐ 10 meters ☐ 3 meters

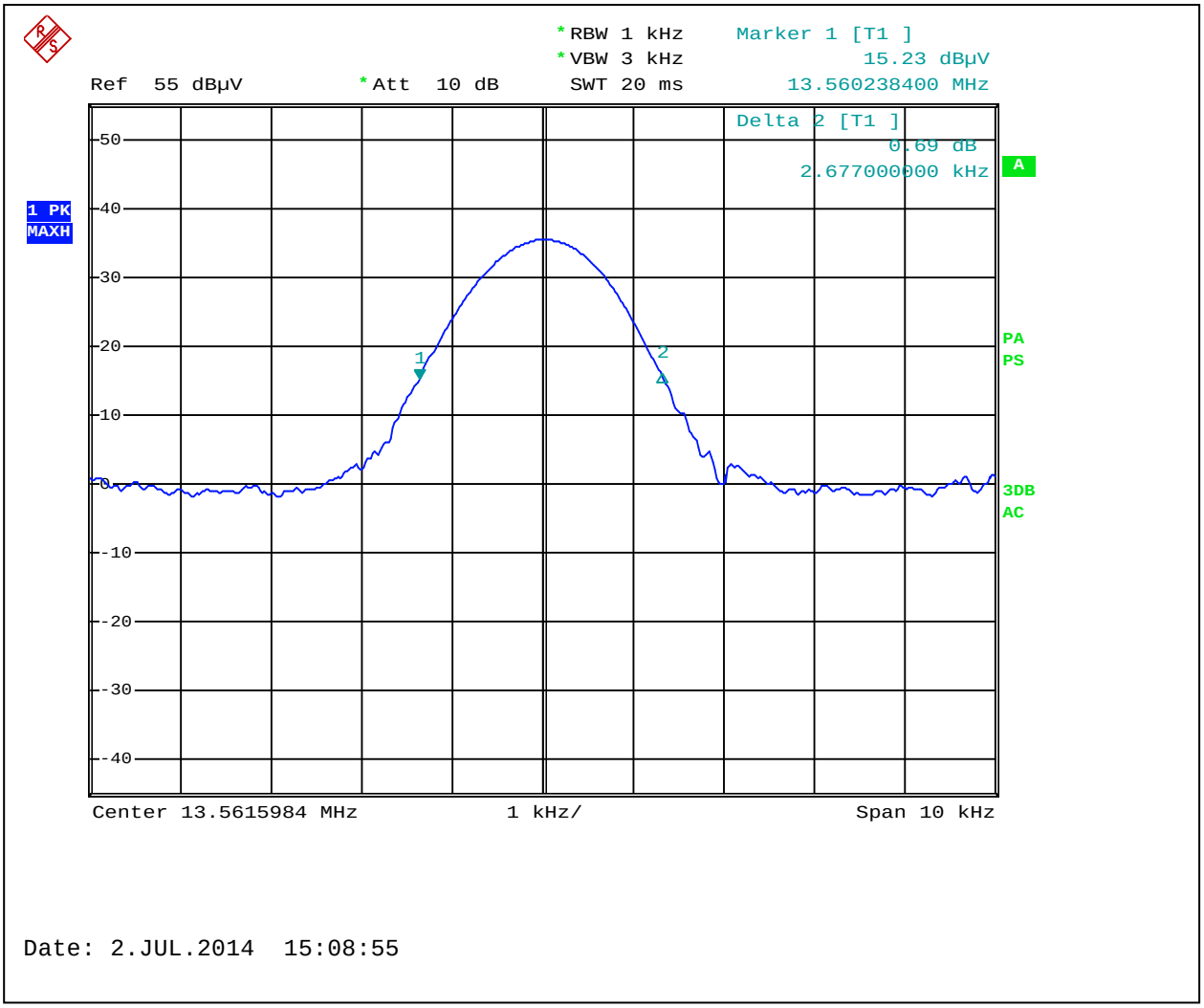
Test result: **Pass**

Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz
13.56	2.677	2.320

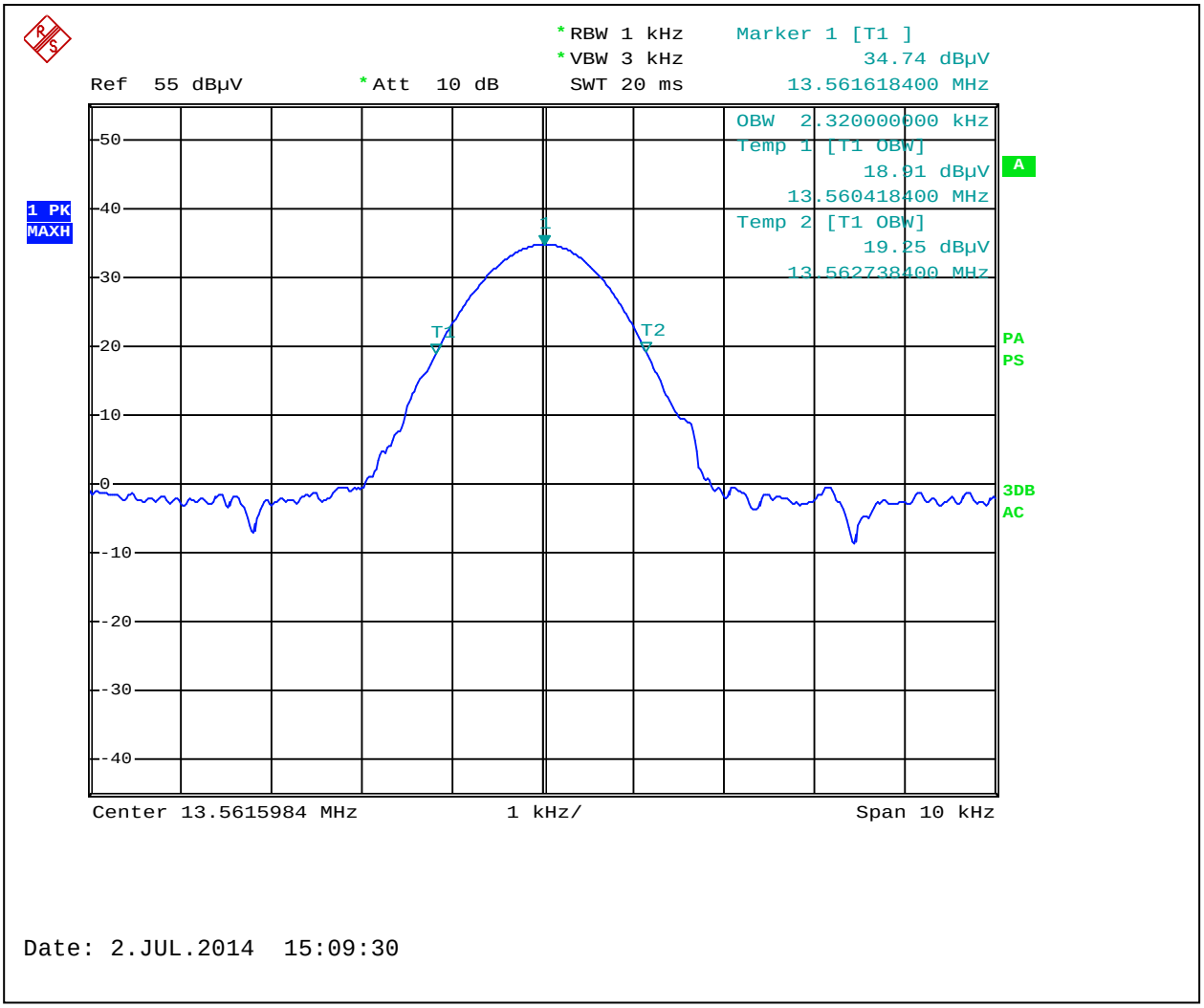
Graphs 3-4-1 and 3-4-2 show bandwidth of emissions

Notes: The bandwidth of emissions is contained within the frequency band of operation

Graph 3.4.1


*RBW 1 kHz
*VBW 3 kHz
Ref 55 dBµV
*Att 10 dB
SWT 20 ms
Marker 1 [T1]
15.23 dBµV
13.560238400 MHz
Delta 2 [T1]
0.69 dB
2.677000000 kHz
A
1 PK
MAXH
PA
PS
3DB
AC
50
40
30
20
10
0
-10
-20
-30
-40
Center 13.5615984 MHz
1 kHz/
Span 10 kHz
Date: 2.JUL.2014 15:08:55

Graph 3.4.2


*RBW 1 kHz
*VBW 3 kHz
Ref 55 dBµV
*Att 10 dB
SWT 20 ms
Marker 1 [T1]
34.74 dBµV
13.561618400 MHz
OBW 2.320000000 kHz
Temp 1 [T1 OBW]
18.91 dBµV
13.560418400 MHz
Temp 2 [T1 OBW]
19.25 dBµV
13.562738400 MHz
1 PK
MAXH
A
PA
PS
3DB
AC
T1
T2
50
40
30
20
10
0
-10
-20
-30
-40
Center 13.5615984 MHz
1 kHz/
Span 10 kHz
Date: 2.JUL.2014 15:09:30

3.5 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 6.2 dB below the limits

Notes: Transmitter RF output was terminated during testing

Date:	July, 8, 2014	**Result:** **Pass**
Standard:	FCC 15.207	
Tested by:	Richard Blonigen	
Test Point:	Power Line	
Operation mode:	See Page 5	
Note:	None	

Table 3.5.1

Line 1

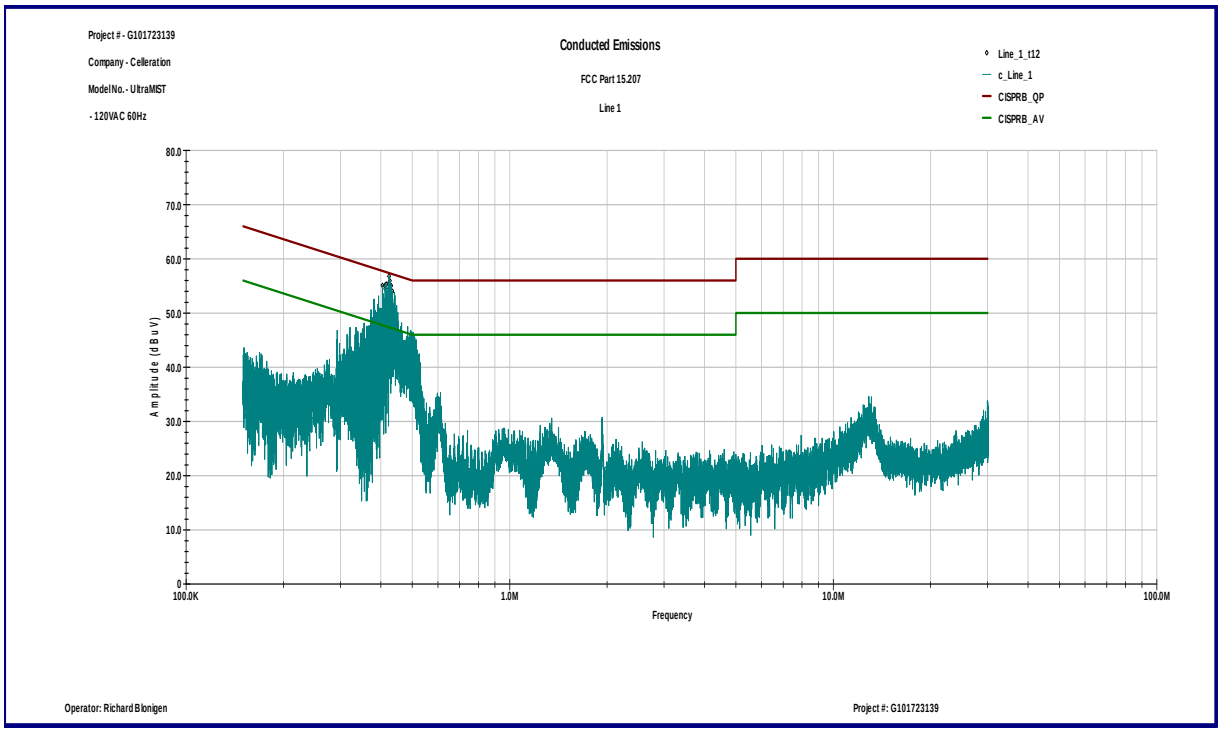
Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
379.61 KHz	45.3	29.5	58.3	48.3	-13.0	-18.7
399.81 KHz	47.8	32.2	57.9	47.9	-10.1	-15.7
428.55 KHz	50.1	37.5	57.3	47.3	-7.2	-9.8
436.4 KHz	48.3	36.0	57.1	47.1	-8.9	-11.1
440.57 KHz	47.8	35.8	57.1	47.1	-9.3	-11.3
493.52 KHz	43.2	32.0	56.1	46.1	-12.9	-14.1

Line 2

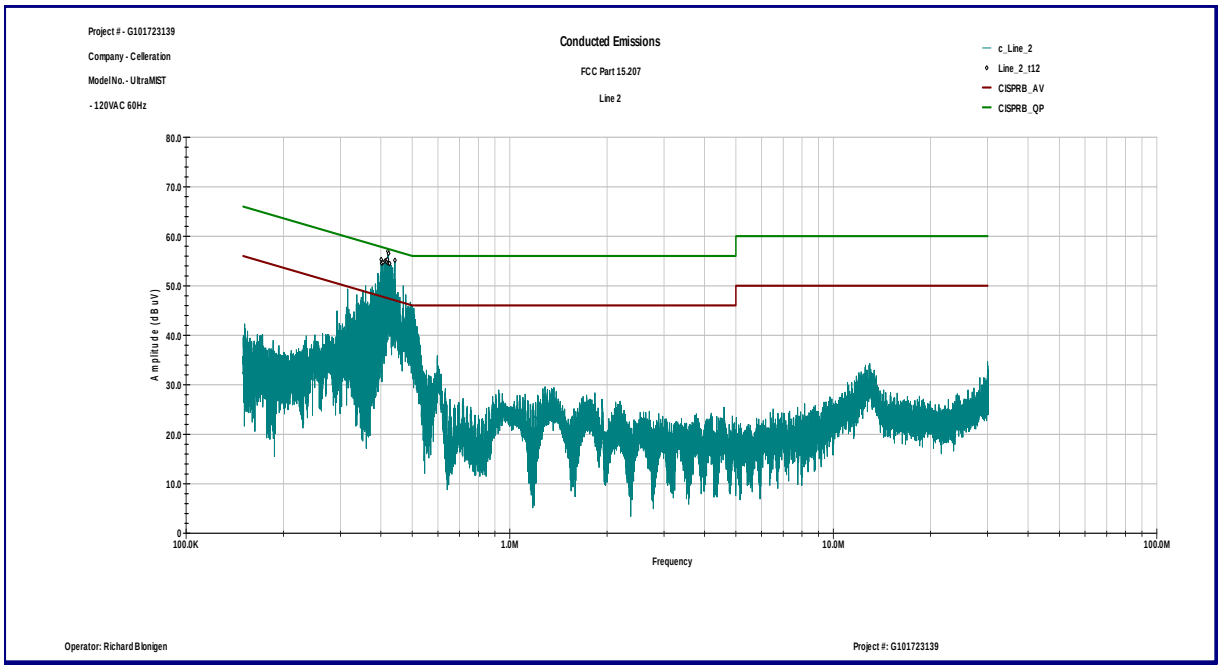
Frequency	QP dBµV	AVG dBµV	QP Limit dBµV	AVG Limit dBµV	QP Margin dB	AVG Margin dB
318.44 KHz	40.5	28.2	59.8	49.8	-19.2	-21.5
377.91 KHz	45.0	29.6	58.3	48.3	-13.3	-18.7
395.99 KHz	47.3	31.0	57.9	47.9	-10.7	-16.9
425.54 KHz	51.2	37.8	57.3	47.3	-6.2	-9.6
431.65 KHz	49.7	36.4	57.2	47.2	-7.5	-10.8
468.47 KHz	41.1	33.3	56.5	46.5	-15.4	-13.3

Graph 3.5.1

Line 1



Line 2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	ESU	100398	25283	01/07/2015	☒
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	08/30/2014	☒
Loop Antenna	ETS	6512	00060486	19942	12/17/2014	☒
LISN	Solar Electronics	9252-50-R-24-BNC	068545	MIN-0060	02/19/2015	☒
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	☒

5.0 Revision History

REVISION LEVEL	DATE	REPORT NUMBER	PREPARED	REVIEWED	NOTES
0	7/8/2014	101723139MIN-001	RB	SK	Original Issue