

EMC Test Report

Project Number: 3715813

Report Number: 3715813EMC02 **Revision Level:** 2

Client: UVLrx Therapeutics Inc.

Product Description: Intravenous Light Therapy System

Product Name: UVLrx Station with RFID

Model Number: UVL1500

Applicable Standards: FCC Part 15 Subpart C, § 15.209

RSS-210, Issue 8, December 2010

ANSI C63.10: 2013

RSS-GEN, Issue 4, November 2014

AS/NZS 4268:2012

Report issued on: 07 October 2015

Test Result: Compliant

Tested by:



Jeremy O. Pickens, Senior EMC Engineer

Reviewed by:



David Schramm, EMC/RF/SAR/HAC Manager

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or Testing done by SGS International Electrical Approvals in connection with distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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1 Summary of Test Results

Basic Standards	Test Result
Emissions Testing	
FCC Part 15, Subpart C, 15.209 / RSS-Gen S7.2.5 - Radiated Emissions	Compliant
FCC Part 15, Subpart C, 15.207 / RSS-Gen S7.2.4 - Conducted Emissions	Compliant
AS/NZS 4268:2012	Compliant

1.1 ***Modifications Required to Compliance***

None

2 General Information

2.1 Client Information

Name: UVLrx Therapeutics Inc.
Address: 640 Brooker Creek Blvd, Suite 455
City, State, Zip, Country: Oldsmar, FL 34677 United States

2.2 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

2.3 General Information of EUT

Model Name: UVLrx Station
Model Number: UVL1500
Serial Number: 2015-1500-005
FCC ID: 2AFFF-UVL1500
IC ID: 20424-UVL1500

Radted Voltage: 100-240Vac, 50/60Hz
Test Voltage: 120Vac, 60Hz

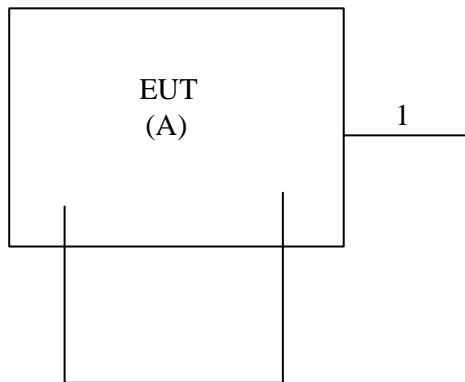
Sample Received Date: 23 March 2015
Date of testing: 23 March– 06 May 2015

2.4 Operating Modes and Conditions

A sample with modified firmware was provided by UVLrx to facilitate testing. Once powered, the RFID began transmitting full power at 13.56MHz.

While the UVL1500 has different mounting options, the device is intended for use in a single orientation and was tested as such. All accessories and interfacing connections are plastic/fiber optic with no facility for metallic connections. Therefore, these pieces were not included in the evaluation as they have no bearing on the electromagnetic performance of the RFID. The interfacing devices were evaluated under IEC 60601-1-2 and were not under the scope of certification.

2.5 EUT Connection Block Diagram



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	UVLrx Therapeutics Inc.	UVLrx Station	UVL1500	2015-1500-005

2.7 Cable List

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	AC Input	EUT	AC Mains	2.4	No	No

3 Radiated Emissions

3.1 Test Result

Test Description	Basic Standards	Test Result
Radiated Emissions	FCC Part 15, Subpart C, 15.209 RSS-Gen S7.2.5 ANSI C63.4:2009	Compliant

3.2 Test Method

Exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak and Average detector above 1GHz. The receivers resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHz and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Radiated emissions limits

Frequency Range (MHz)	Limits (uV/m) Quasi-Peak or Average	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: For measurements below 30MHz at closer distance, the limits were adjusted using the square of an inverse linear distance extrapolation factor (40 dB/decade).

3.3 Test Site

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C
Relative Humidity: 51.0 %
Atmospheric Pressure: 97.9 kPa

3.4 Test Equipment

Test Dates: 27-May-2015

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
LOOP (ACTIVE)	6502	EMCO	B085752	24-Jun-2015
RF CABLE	SF104	HUBER&SUHNER	B085905	6-Aug-2015
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	4-Aug-2015
RF CABLE	SF106	HUBER&SUHNER	B085892	5-Aug-2015
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015
ANTENNA, BILOG	JB6	SUNOL	B079690	7-Oct-2015
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	4-Aug-2015

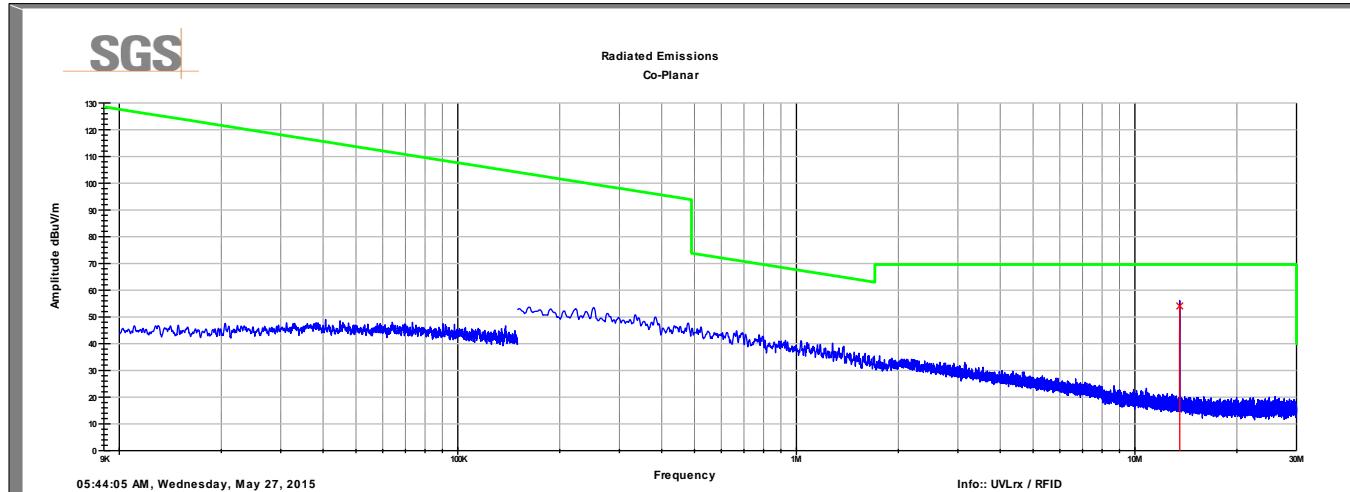
Note: The calibration period equipment is 1 year.

Software:

“Radiated Emissions” TILE! profile dated 15 Oct 2011

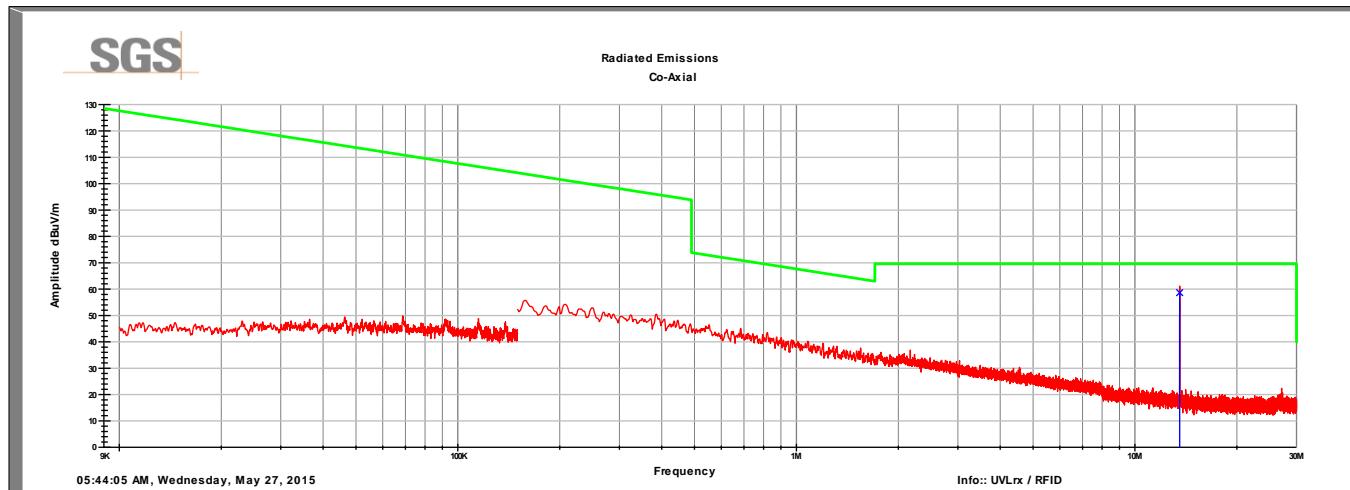
3.5 Test Data

Co-Planar Radiated Emissions Data (9kHz-30MHz) 3-meter test distance

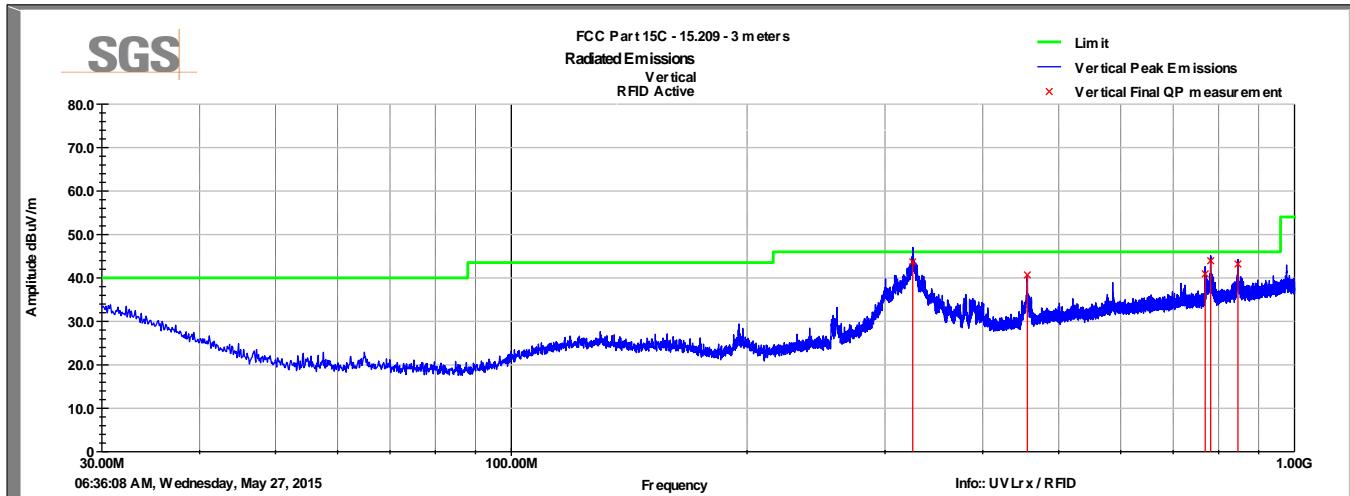


Frequency MHz	Raw QP (dBuV)	Polarity (CA/CP)	Azimuth (degrees)	Height (cm)	AF (dBs/m)	CL (dB)	Dist Conv (dB)	QP Value (dBuA/m)	Limit (dBuA/m)	Margin (dB)
13.56	43.1	CP	171.0	100.0	10.8	0.2	0.0	54.1	69.5	-15.5
QP Value = Level + AF + CL - Amp										

Co-Axial Radiated Emissions Data (9kHz-30MHz) 3-meter test distance



Frequency MHz	Raw QP (dBuV)	Polarity (CA/CP)	Azimuth (degrees)	Height (cm)	AF (dBs/m)	CL (dB)	Dist Conv (dB)	QP Value (dBuA/m)	Limit (dBuA/m)	Margin (dB)
13.56	47.7	CA	104.0	100.0	10.8	0.2	0.0	58.6	69.5	-10.9
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

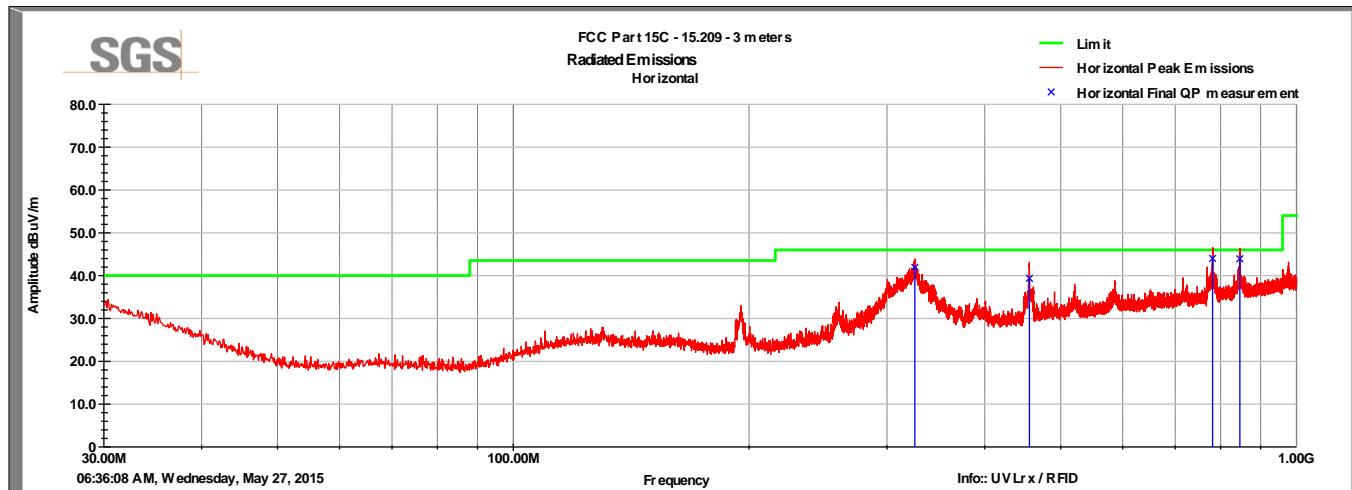
Vertical Radiated Emissions Plot (30-1000MHz)
3-meter test distance


Vertical Radiated Emissions Data (30-1000MHz)

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
325.50	27.5	V	34.0	192.0	14.7	1.5	0.0	43.7	46.0	-2.3
455.96	21.6	V	207.0	256.0	17.3	1.7	0.0	40.7	46.0	-5.3
769.07	17.2	V	274.0	135.0	21.4	2.3	0.0	40.9	46.0	-5.1
781.58	20.0	V	135.0	126.0	21.7	2.3	0.0	43.9	46.0	-2.1
846.72	18.2	V	211.0	140.0	22.6	2.4	0.0	43.2	46.0	-2.8
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Note: None of these measurements were harmonics of the 13.56MHz fundamental

Horizontal Radiated Emissions Plot (30-1000MHz)
3-meter test distance



Horizontal Radiated Emissions Data (30-1000MHz)

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
325.66	25.7	H	316.0	300.0	14.7	1.5	0.0	41.9	46.0	-4.1
456.05	20.3	H	204.0	150.0	17.3	1.7	0.0	39.4	46.0	-6.6
781.56	20.0	H	272.0	378.0	21.7	2.3	0.0	44.0	46.0	-2.0
846.58	18.9	H	189.0	186.0	22.6	2.4	0.0	43.9	46.0	-2.1
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Note: None of these measurements were harmonics of the 13.56MHz fundamental

4 Conducted Emissions

4.1 Test Result

Test Description	Basic Standards	Test Result
Conducted Emissions	FCC Part 15, Subpart C, 15.207 RSS-Gen S7.2.4 ANSI C63.4:2009	Compliant

4.2 Test Method

With the receivers resolution bandwidth was set to 9 kHz the initial preliminary exploratory scans were performed over the measuring frequency range (0.15MHz to 30MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Class B Limits (dBuV)
0.15 to 0.5 MHz	Avg 56 to 46 QP 66 to 56
0.5 to 5 MHz	Avg 46 Pk 56
5 to 30 MHz	Avg 50 Pk 60

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.8 °C
Relative Humidity: 41.5 %
Atmospheric Pressure: 98.48 Kpa

4.4 Test Equipment

Test Date: 3/25/2015

Tested By: FL

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
TWO-LINE V-NETWORK	NNB 51	TESEQ	B085882	23-Sep-2015
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015
COAXIAL CABLE	CBL-25FT-NMNM	MINI-CIRCUIT	B094941	5-Aug-2015

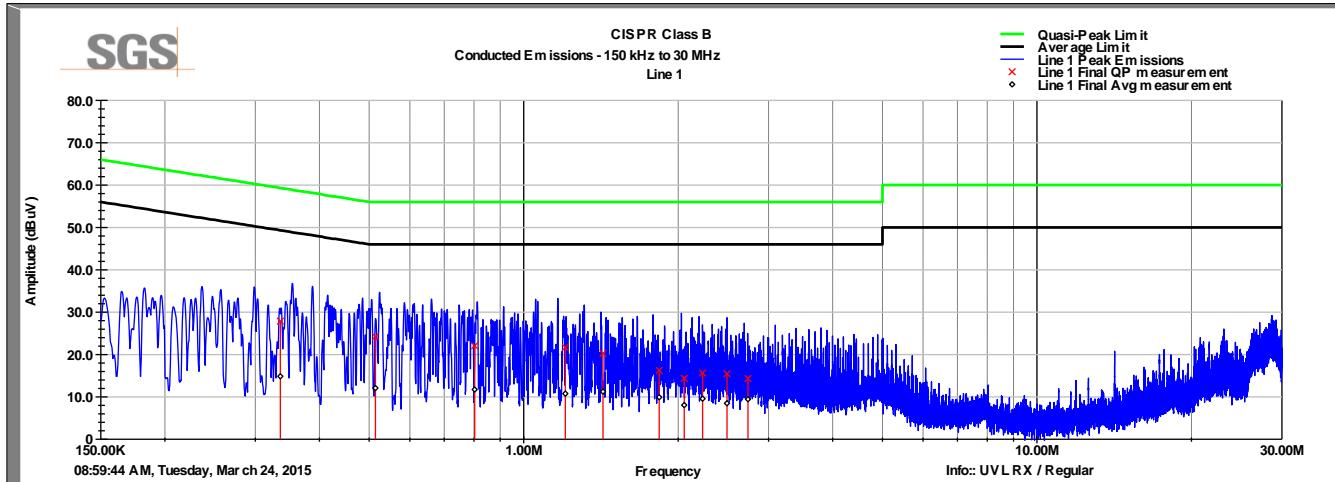
Note: The calibration period equipment is 1 year.

Software:

“Conducted Emissions” TILE! profile dated 6 Mar 2013

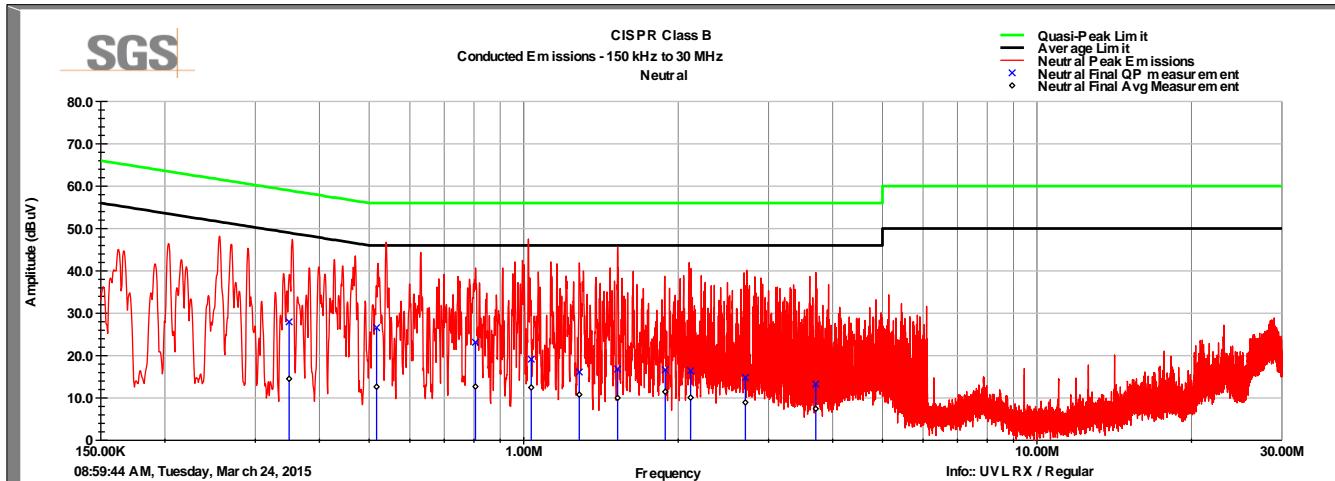
4.5 Test Data

Conducted Emissions Plot 150kHz-30MHz
Line 1



Conducted Emissions Data 150kHz-30MHz
Line 1

Frequency MHz	QP Value dBuV	QP Limit dBuV	Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.336	27.9	59.3	-31.4	14.9	49.3	-34.4
0.514	24.2	56.0	-31.8	12.1	46.0	-33.9
0.803	22.1	56.0	-33.9	11.7	46.0	-34.3
1.206	21.7	56.0	-34.3	10.8	46.0	-35.2
1.427	20.3	56.0	-35.7	11.2	46.0	-34.8
1.836	16.2	56.0	-39.8	9.9	46.0	-36.1
2.055	14.4	56.0	-41.6	8.0	46.0	-38.0
2.231	15.6	56.0	-40.4	9.6	46.0	-36.4
2.490	15.5	56.0	-40.5	8.5	46.0	-37.5
2.735	14.3	56.0	-41.7	9.4	46.0	-36.6

Conducted Emissions Plot 150kHz-30MHz
Neutral

Conducted Emissions Data 150kHz-30MHz
Neutral

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.349	28.0	59.0	-31.0	14.5	49.0	-34.5
0.517	26.6	56.0	-29.4	12.6	46.0	-33.4
0.806	23.1	56.0	-32.9	12.7	46.0	-33.3
1.035	19.1	56.0	-36.9	12.5	46.0	-33.5
1.283	16.1	56.0	-39.9	10.8	46.0	-35.2
1.524	16.8	56.0	-39.2	10.0	46.0	-36.0
1.887	16.6	56.0	-39.4	11.5	46.0	-34.5
2.115	16.4	56.0	-39.6	10.1	46.0	-35.9
2.703	14.8	56.0	-41.2	8.9	46.0	-37.1
3.708	13.3	56.0	-42.7	7.4	46.0	-38.6

5 Occupied Bandwidth

5.1 Test Result

Test Description	Basic Standards	Test Result
99% Bandwidth	RSS-GEN 4.6.1	Reported

5.2 Test Method

The 99% occupied bandwidth measurement function of the spectrum analyzer was employed.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.2 °C

Relative Humidity: 51.0 %

5.4 Test Equipment

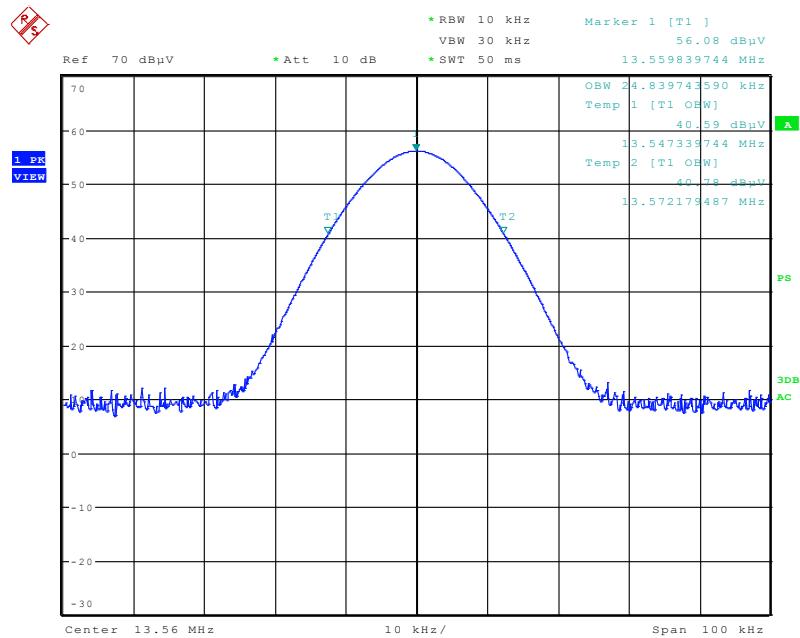
Test Dates: 27-May-2015

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
LOOP (ACTIVE)	6502	EMCO	B085752	24-Jun-2015
RF CABLE	SF104	HUBER&SUHNER	B085905	6-Aug-2015
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015

Note: The calibration period equipment is 1 year.

5.5 Test Data



Date: 26.MAY.2015 07:17:51

Occupied Bandwidth = 24.8kHz

6 Frequency Stability

6.1 Test Result

Test Description	Basic Standards	Test Result
Frequency Stability	AS/NZS 4268	Compliant

6.2 Test Method

The signal frequency was measured at both normal and extreme temperature conditions with the device placed in an environmental chamber. At each temperature required, the EUT was immersed in a calibrated temperature controlled chamber. The EUT was allowed a minimum of 30 minutes to thermally stabilize at each temperature. The EUT was then powered on, and the charging frequency was measured and compared against the nominal temperature measurement. Measurements were repeated at extreme input voltages (nominal +/-10%).

6.3 Test Site

EMC Laboratory, Suwanee, GA

6.4 Test Equipment

Test Dates: 26-Mar-2015

Tester: FRN

6-May-2015

JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
RF CABLE	SF106	HUBER&SUHNER	B085892	5-Aug-2015
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015
ENVIRONMENTAL CHAMBER	T2RC	TENNEY	B094877	CNR

Note: The calibration period equipment is 1 year.

6.5 Test Result

Fundamental Measurement – Frequency deviation				
-20°C		Nominal (MHz)	55°C	
90Vac	264Vac		90Vac	264Vac
<10 Hz	<10 Hz	13.56	<10 Hz	<10 Hz

7 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	27 May 2015
1	<ul style="list-style-type: none">- Added FCC and IC IDs to Page 5- Inserted conducted emissions section with results	17 September 2015
2	<ul style="list-style-type: none">- Updated cover page to reflect 2103 version of ANSI C63.10- Added additional information regarding EUT positioning and accessories to Section 2.4 on page 4.- Added explanation of test distance affect on limit to page 6.- Added measurement distance to radiated test results on pages 8, 9, and 10.	07 October 2015