

EMC Test Report

Project Number: 2815734

Report Number: 2815734EMC03

Revision Level: 2

Client: Guided Therapeutics

Equipment Under Test: Advanced cervical scanner

Model Name: Luviva

Model Number: 13500

Applicable Standards: FCC Part 15 §15.225

Report issued on: 20NOV2013

Test Result: Compliant

Tested by:

A handwritten signature in black ink, appearing to read 'B. Forster', is written over a horizontal line.

Brian Forster, EMC Engineer

Reviewed by:

A handwritten signature in blue ink, appearing to read 'David Schramm', is written over a horizontal line.

David Schramm, EMC 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 15.225, Radiated Emissions	Compliant
FCC Part 15.225 Frequency Stability	Compliant

1.1 *Modifications Required to Compliance*

None

2 General Information

2.1 Client Information

Name: Guided Therapeutics
Address: 5835 PEACHTREE CORNERS EAST
SUITE D
City, State, Zip, Country: NORCROSS GA 30092

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

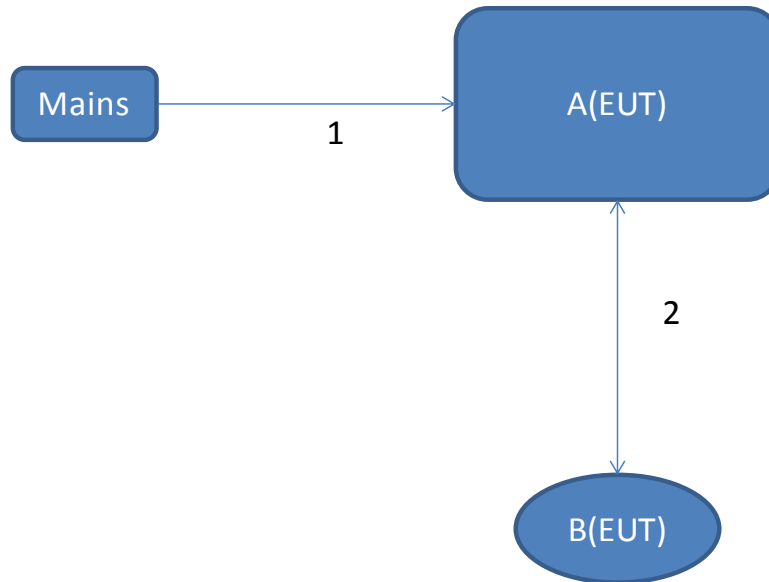
2.3 General Information of EUT

Product Name: Luviva Advanced Cervical Scanner
Model Name: Luviva
Model Number: 13500
Serial Number: 110005
Hardware Version: 3013500 Rev 0
Software Version: Compliance 1.0.4661.25533 Luviva 12.10.23.9
Rated Voltage: 120 VAC 60Hz or 230 VAC 50Hz
Test Voltage: 120 VAC and 230 VAC
Sample Received Date: 28September 2012
Dates of testing: 02October 2012 to 03May2013

2.4 Operating Modes and Conditions

The EUT was programmed by the manufacturer to run continuously exercising all modes of operation.

2.5 EUT Connection Block Diagram



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Guided Therapeutics	Base Unit	13500	110005
B	Guided Therapeutics	Handheld Unit	13500	110005

2.7 Cable List

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	AC	EUT	AC mains	1.0m	No	No
2	Handheld	EUT	Handheld EUT	1m	No	Yes

3 Radiated Emissions

3.1 Test Result

Test Description	Basic Standards	Test Result
Radiated Emissions	FCC Part 15.225, (a,b,c,d) ANSI C63.4:2009	Compliant

3.2 Test Method

The initial preliminary 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.

In the range 9k to 30 MHz the exploratory scans were performed with a Peak detector with 1kHz RBW/3kHz VBW settings. Final Measurements were performed with a Receiver with 1kHz RBW and Average detector.

The Emissions in the range 13.110 to 14.1 MHz were compared to the limits in 15.225

Radiated emissions limit below 1 GHz

Frequency Range	Limits (dBuV/m) Quasi-Peak		Equipment Classification
	3 m	10 m	
30 to 230 MHz	40.5	30	Class B
230 to 1000 MHz	47.5	37	

Frequency Range	Limits (dBuV/m) Quasi-Peak		Equipment Classification
	3 m	10 m	
30 to 230 MHz	50.5	40	Class A
230 to 1000 MHz	57.5	47	

Radiated emissions limit above 1 GHz

Frequency Range	Class A Limits (dBuV/m)		Class B Limits (dBuV/m)	
	FCC	CISPR	FCC	CISPR
1 to 3 GHz	Avg 60 Pk 80	Avg 56 Pk 76	Avg 54 Pk 74	Avg 50 Pk 70
3 to 6 GHz	Avg 60 Pk 80	Avg 60 Pk 80	Avg 54 Pk 74	Avg 54 Pk 74
6 to 40 GHz	Avg 60 Pk 80	No requirement	Avg 54 Pk 74	No requirement

3.3 Test Site

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

Environmental Conditions

Temperature: 22.8 °C

Relative Humidity: 33.9 %

Atmospheric Pressure: 98.9 kPa

3.4 Test Equipment

Test Start Date: 11/20/2012

Tested By: BKF

Test End Date: 11/20/2012

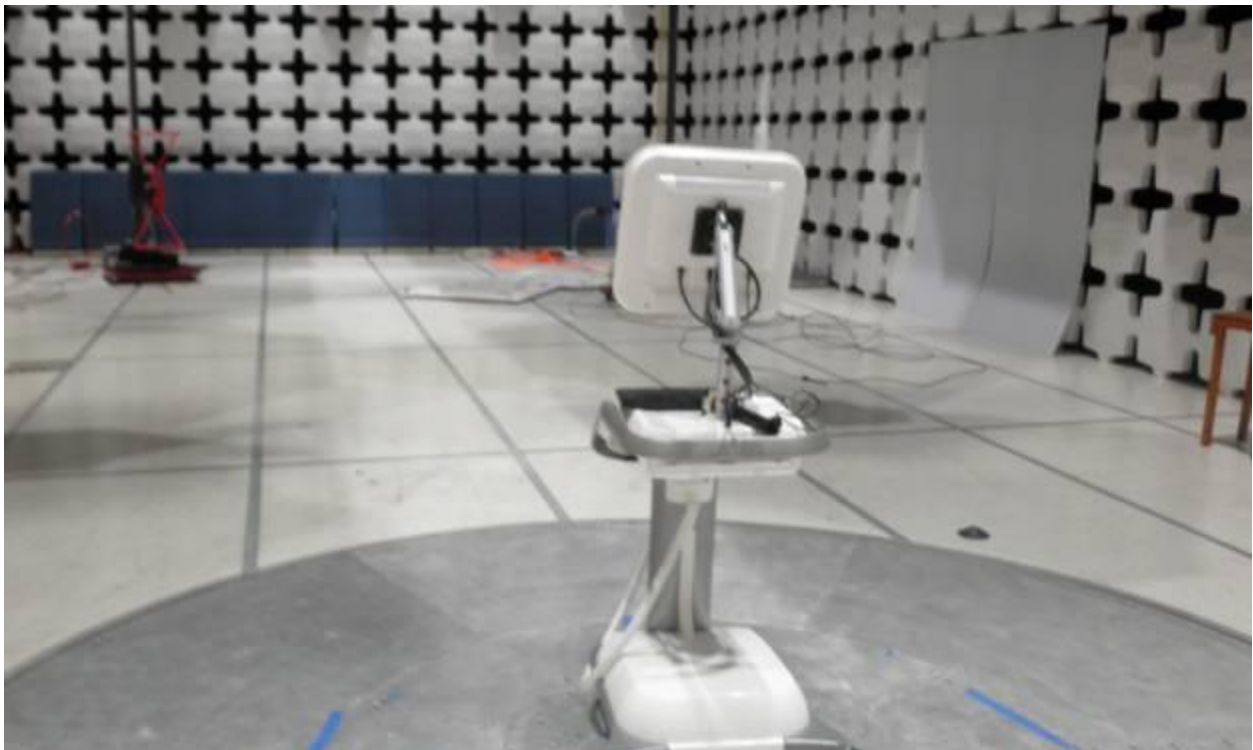
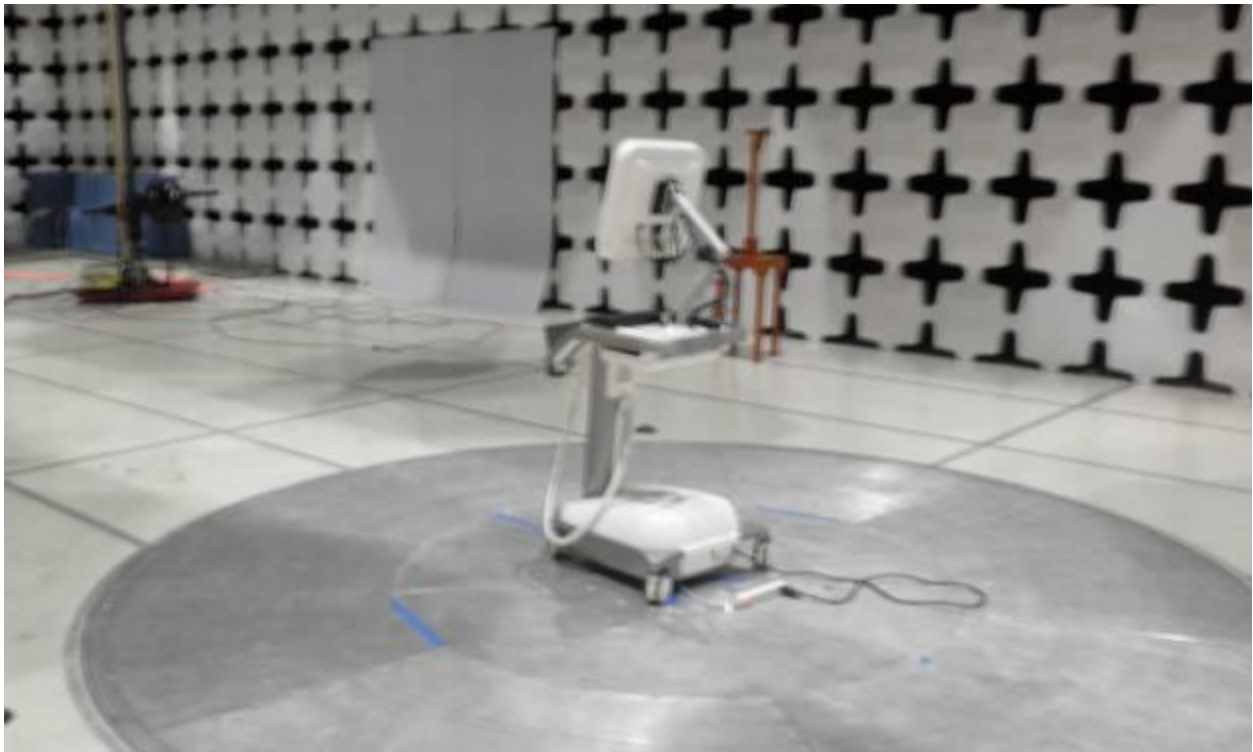
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Bilog Antenna	JB6	Teseq	B079690	12-Sep-13
Magneic Loop Antenna	6502	ETS-Lindgren	B085752	3-Jun-13
Coaxial Cable	Sucoflex 106	Huber+Suhner	B085887	13-Aug-13
Coaxial Cable	Sucoflex 106	Huber+Suhner	B079714	13-Aug-13
Coaxial Cable	Sucoflex 106	Huber+Suhner	B079661	13-Aug-13
EMI Test Receiver	ESU40	R&S	B079629	24-Sep-13

Note: The calibration period equipment is 1 year.

Software:

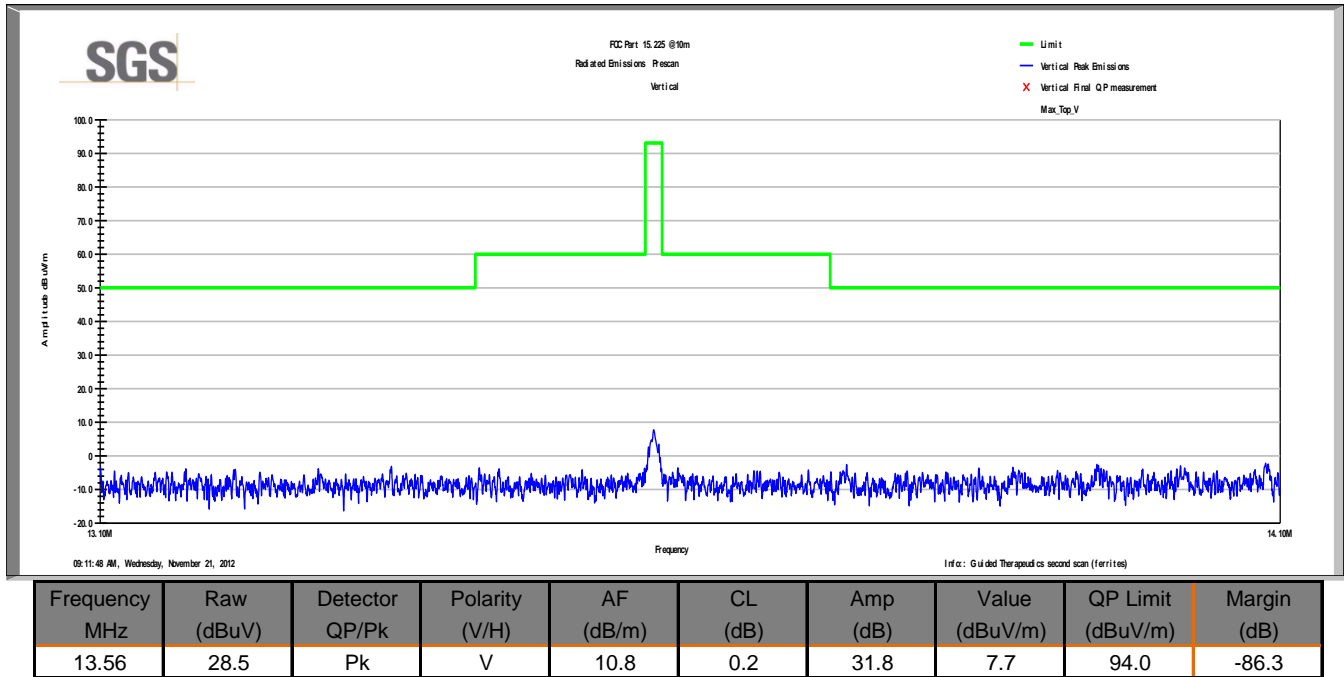
“Radiated Emissions” TILE! profile dated 15 Oct 2011

3.5 Test Setup Photographs

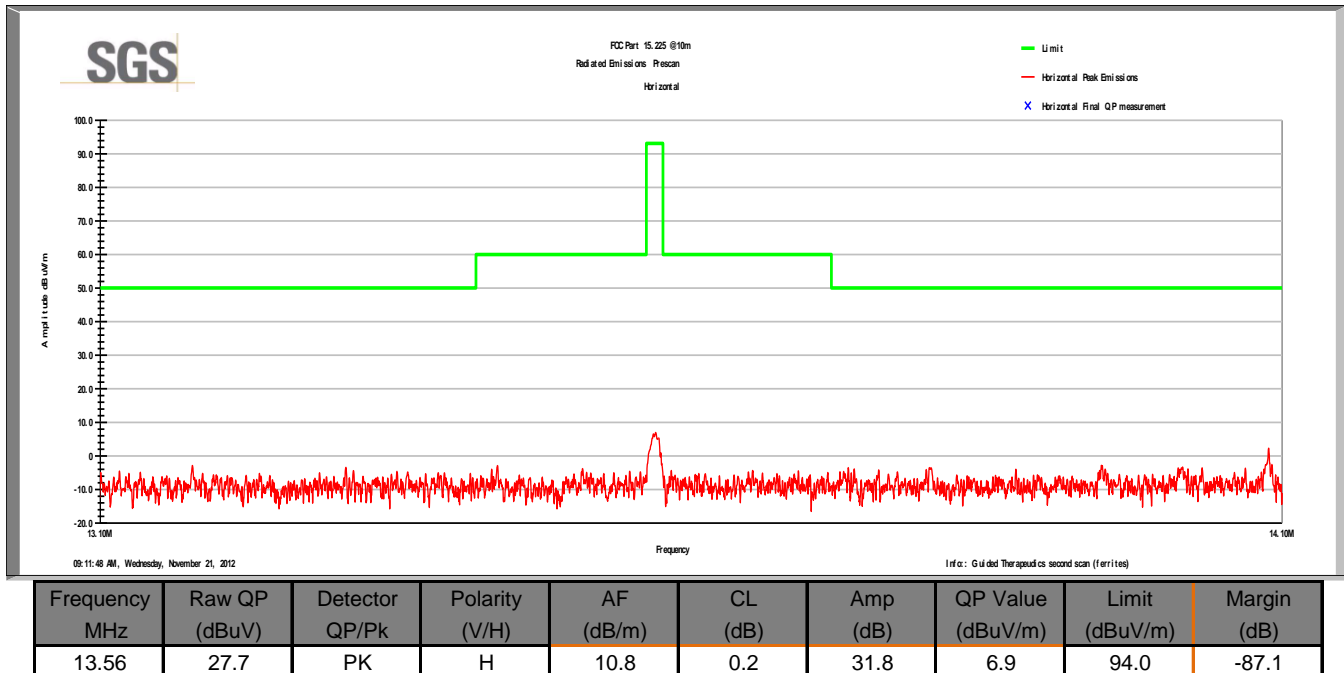


3.6 Test Data

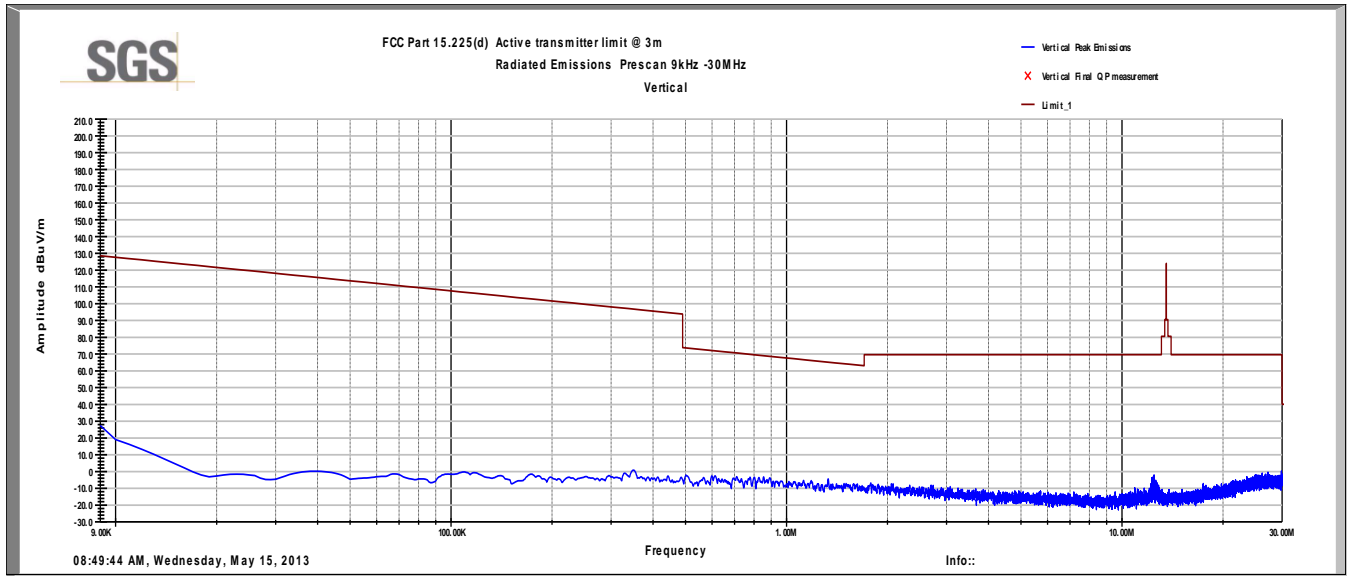
Part 15.225(a,b,c) RFID Active Vertical



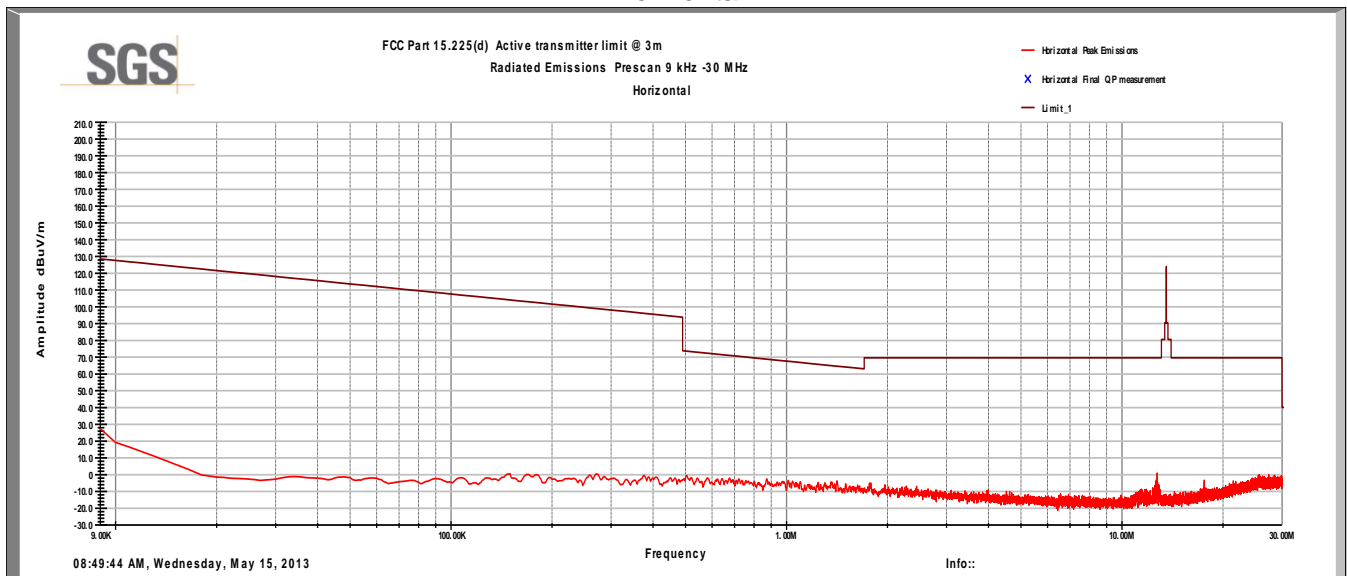
Horizontal



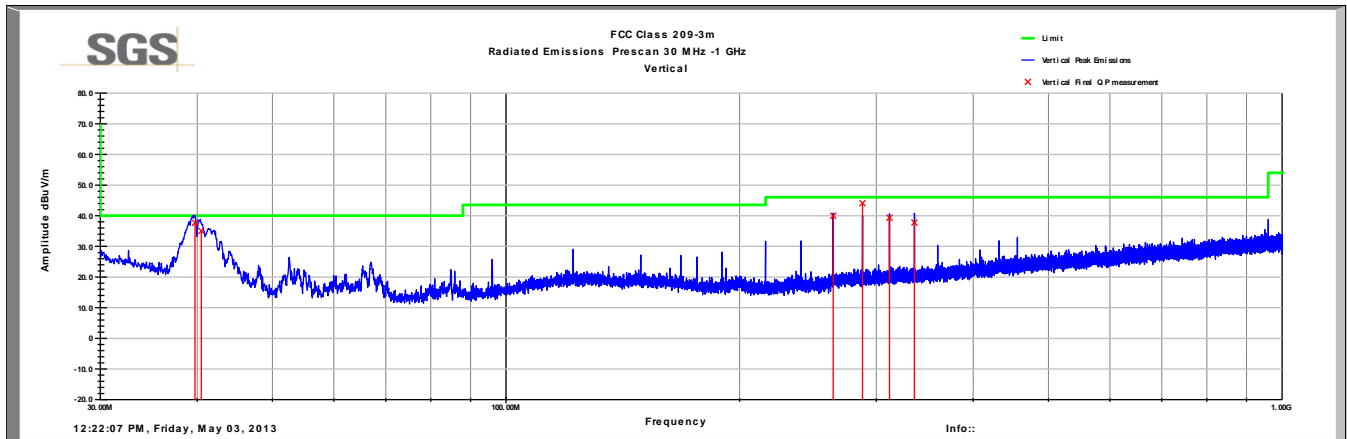
Part 15.225(a,b,c)
9kHz to 30 MHz
Vertical



Horizontal



Part 15.225(d) Vertical Radiated Emissions Plot



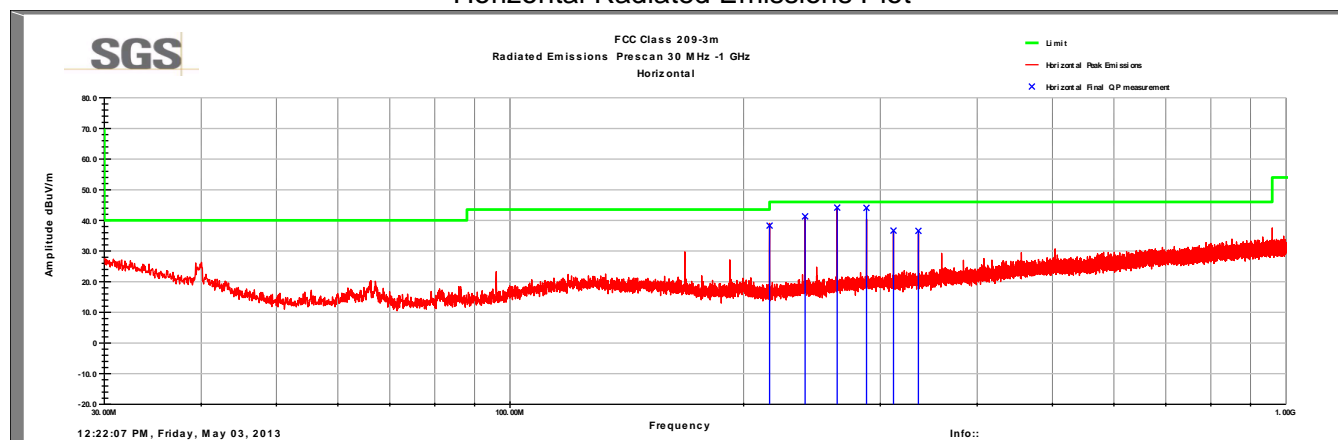
Vertical Radiated Emissions Data

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)
39.74	23.3	V	42.0	111.0	13.8	0.6	0.0	37.7	40.0	-2.3
40.49	21.2	V	74.0	111.0	13.2	0.6	0.0	35.0	40.0	-5.0
264.00	25.5	V	26.0	180.0	12.9	1.6	0.0	40.0	46.0	-6.0
288.00	28.9	V	9.0	203.0	13.5	1.7	0.0	44.1	46.0	-2.0
312.00	23.8	V	212.0	157.0	13.8	1.7	0.0	39.3	46.0	-6.7
336.00	21.8	V	228.0	204.0	14.1	1.8	0.0	37.7	46.0	-8.3

Fundamental Harmonics

Frequency MHz	Raw (dBuV)	Detector QP/Pk	Polarity (V/H)	AF (dB/m)	CL (dB)	Amp (dB)	Value (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
122.05	14.3	Pk	V	13.7	1.1	0.0	29.1	40.0	-10.9
149.16	13.5	Pk	V	12.5	1.2	0.0	27.1	40.0	-12.9
176.23	14.2	Pk	V	11.2	1.3	0.0	26.7	46.0	-19.3
189.85	15.8	Pk	V	11.0	1.3	0.0	28.1	46.0	-17.9
312.00	23.8	QP	V	13.8	1.7	0.0	39.3	46.0	-6.7

Horizontal Radiated Emissions Plot



Horizontal Radiated Emissions Data

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)
216.00	26.3	H	114.0	158.0	10.6	1.4	0.0	38.3	43.5	-5.3
240.00	28.2	H	87.0	134.0	11.6	1.5	0.0	41.3	46.0	-4.7
264.00	29.7	H	72.0	181.0	12.9	1.6	0.0	44.1	46.0	-1.9
288.00	28.9	H	311.0	111.0	13.5	1.7	0.0	44.1	46.0	-2.0
312.00	21.1	H	88.0	157.0	13.8	1.7	0.0	36.7	46.0	-9.3
336.00	20.6	H	237.0	157.0	14.1	1.8	0.0	36.6	46.0	-9.5

Fundamental Harmonics

Frequency MHz	Raw QP (dBuV)	Detector QP/Pk	Polarity (V/H)	AF (dB/m)	CL (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
312.00	21.1	QP	H	13.8	1.7	0.0	36.7	46.0	-9.3

4 Frequency Tolerance

4.1 Low Voltage Conditions

4.1.1 Test Result

Test Description	Test Specification	Test Result
Frequency Tolerance	FCC 15.225(e)	Compliant

4.1.2 Test Method

An unmodulated carrier signal was measured at both normal and extreme temperature conditions. At each temperature required, the EUT was immersed in a calibrated temperature controlled chamber, set to the requisite level. The EUT was allowed a minimum of 30 minutes to thermally stabilize. The EUT was then powered on, configured to transmit a single unmodulated signal. The frequency was measured in this condition and compared to the normal condition frequency value.

Frequency tolerance limit: **1356Hz**

4.1.3 Test Site

EMC Laboratory, Suwanee, GA

4.1.4 Extreme Temperature Conditions

4.1.5 Test Result

Test Description	Test Specification	Test Result
Frequency Stability Under Extreme Temperature Conditions	Part 15.225(e)	Compliant

4.1.6 Test Method

Testing was performed i.a.w. 15.225(e), the mains voltage was varied between 85 and 115%; the carrier frequency was measured and recorded for each voltage setting and compared to the tolerance limit.

4.1.7 Test Equipment

Test Start Date: 12/11/2012

Tested By: FRN

Test End Date: 12/12/2012

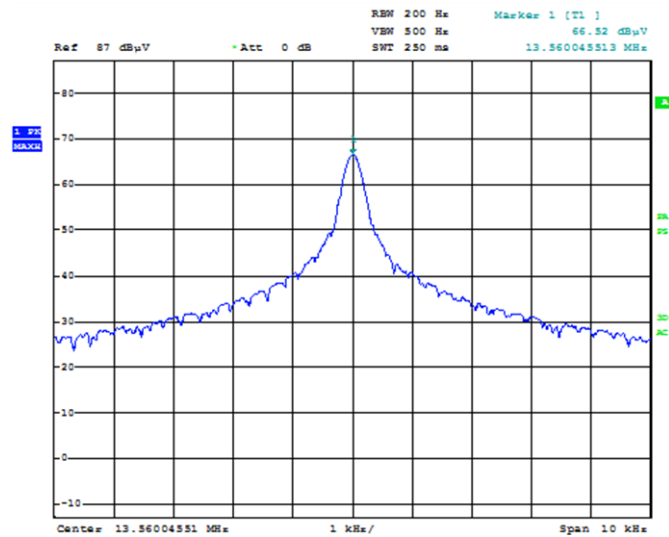
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Receiver	ESU-8	R&S	B085759	12-Jun-13
Environmental Chamber	SM-16-8200	Thermotron	B079727	8-Aug-13
RF Cable	SF106	Huber and Suhner	B079661	13-Aug-13
Humidity/Temperature Stop Watch	HW30	Extech	L90	24-Feb-13

Note: The calibration period equipment is 1 year.

4.1.8 Test Data

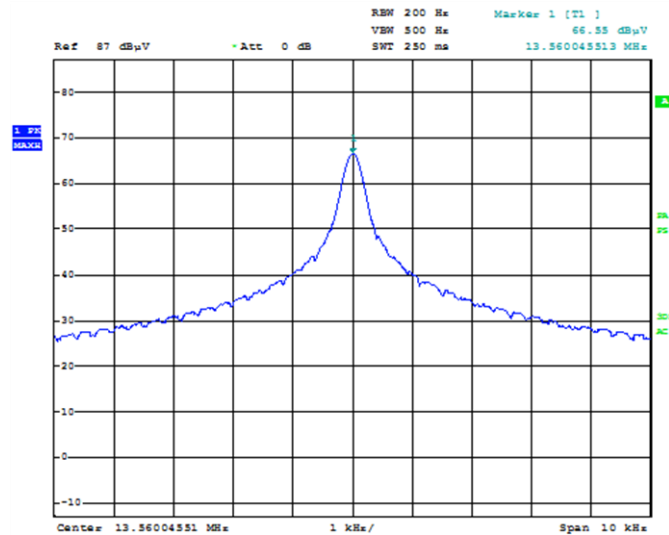
Results: No discernible frequency deviation was measured over all varying test voltages; this is attributed to the use of a switching power supply for the EUT which accepts 95 to 264 VAC 50/60 Hz inputs.

207VAC 50 Hz



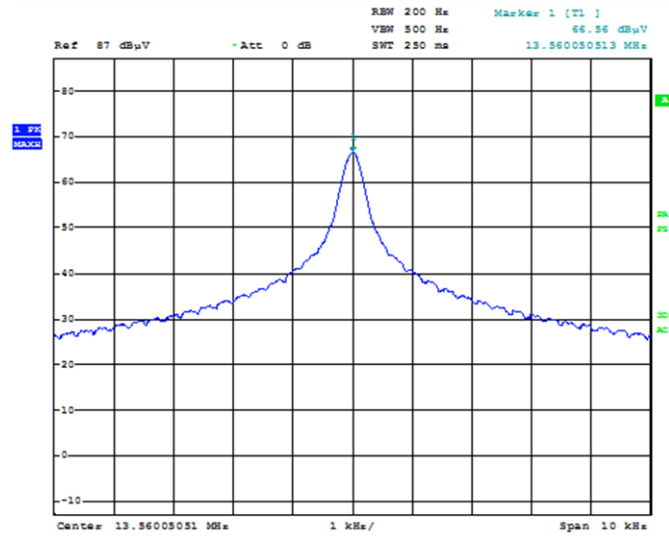
Date: 27.NOV.2012 23:03:32

264 VAC 50 Hz



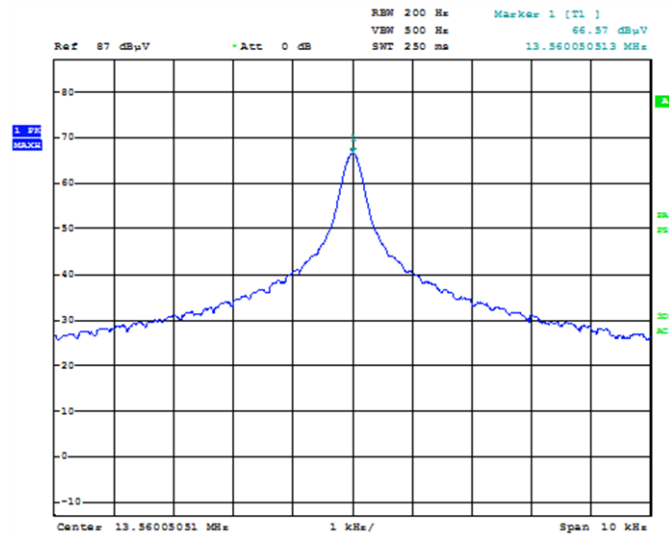
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120VAC 60 Hz



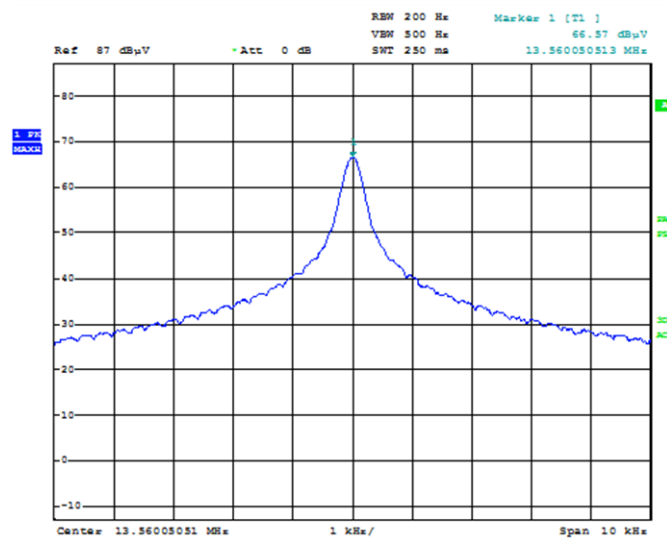
Date: 27.NOV.2012 23:07:19

102 VAC 60 Hz



Date: 27.NOV.2012 23:08:12

138 VAC 60 Hz



Date: 27.NOV.2012 23:09:29

4.2 Test Method

Testing was performed i.a.w. 15.225(e), the EUT was placed in a temperature controlled chamber and varied between -20 and +50 degrees C; the carrier frequency was measured and recorded for each voltage setting and compared to the tolerance limit

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.2 °C

Relative Humidity: 27.3 %

Atmospheric Pressure: 98.3 kPa

4.4 Test Site

SGS EMC Laboratory, Suwanee, GA

4.5 Test Equipment

Test Start Date: 12/11/2012

Tested By: FRN

Test End Date: 12/12/2012

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Receiver	ESU-8	R&S	B085759	12-Jun-13
Environmental Chamber	SM-16-8200	Thermotron	B079727	8-Aug-13
RF Cable	SF106	Huber and Suhner	B079661	13-Aug-13
Humidity/Temperature Stop Watch	HW30	Extech	L90	24-Feb-13

Note: The calibration period equipment is 1 year.

4.6 Test Setup Photographs



4.7 Test Data

Baseline 13.560144231MHz at 23.4°C		
Temperature °C	Frequency MHz	Frequency Deviation Hz
-20°C	13.56032051	176.282
-10°C	13.56030449	160.256
0°C	13.56028846	144.231
10°C	13.56025641	112.179
20°C	13.56019231	48.077
30°C	13.56014423	0
40°C	13.56011218	-32.052
50°C	13.5600641	-80.128

5 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	05JUN13
1	Added tabular data for fundamental and fundamental harmonics measurements	14OCT2013
2	Adjusted 15.225 limits on Page 9	20NOV2013