

EMC Test Report

Project Number: 3834264

Report Number: 3834264EMC01

Revision Level: 1

Client: Sebotek Hearing Systems

Product Description: Hearing Aid

Model Number: HD390

FCC ID: 2ADKC-WHD

IC ID: 20701-WHD

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

Report issued on: 16 November 2015

Test Result: Compliant

Tested by:



Fabian Nica, Senior Technician

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	Not Applicable(1)

Note 1: EUT is battery powered

1.1 *Modifications Required to Compliance*

None

2 General Information

2.1 *Client Information*

Name: Sebotek Hearing Systems
Address: 2488 E. 81st St., Suite 2000
City, State, Zip, Country: Tulsa, OK 74137

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 Number: HD390

Serial Number: 5JH931 right
5JH930 left

Rated Voltage: 1.4V coin cell battery

Test Voltage: New 1.4V coin cell replaceable hearing aid battery

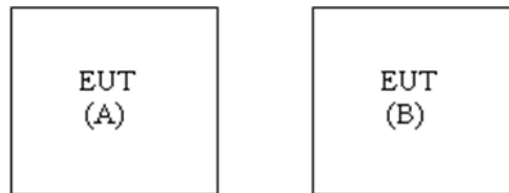
Sample Received Date: 31 August 2015

Date of testing: 10 September 2015

2.4 *Operating Modes and Conditions*

The EUT was programmed by Sebotek to binaural synchronization which enabled both left and right hearing aids to work together as one system. The transceiver operated at 10.5MHz.

2.5 EUT Connection Block Diagram



2.6 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Sebotek	Hearing Aid Left	HD390	5JH930
B	Sebotek	Hearing Aid Right	HD390	5JH931

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 C63.4:2014	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: 22.6 °C
 Relative Humidity: 49.9 %
 Atmospheric Pressure: 97.4 kPa

3.4 Test Equipment

Test Date: 10-Sep-2015

Tester: FRN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	4-Aug-2016
ANTENNA, BILOG	JB6	SUNOL	B079690	7-Oct-2015
RF CABLE - 12000MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079714	4-Aug-2016
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	4-Aug-2016
RF CABLE	SF106	HUBER&SUHNER	B085892	4-Aug-2016
PREAMPLIFIER-ANTENNA SYS	TS-PR18	ROHDE & SCHWARZ	B094463	13-Feb-2016
LOOP (ACTIVE)	6502	EMCO	B085752	7-Jul-2016
RF CABLE - 7000MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079712	4-Aug-2016

Note: The calibration period equipment is 1 year.

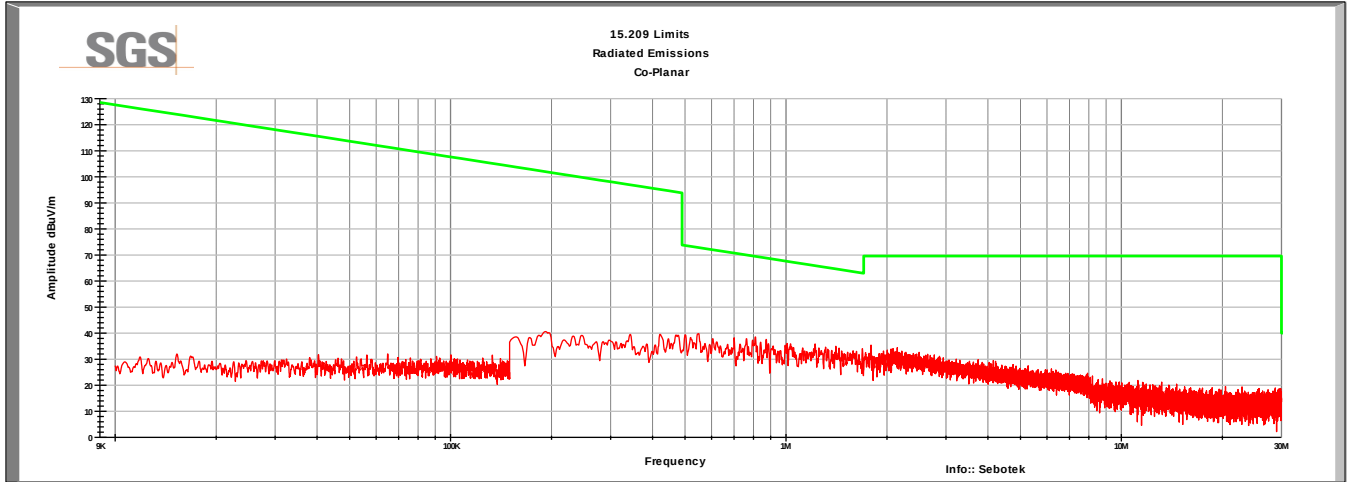
Software:

"Radiated Emissions" 9kHz-30MHz TILE! profile dated 10 September 2015

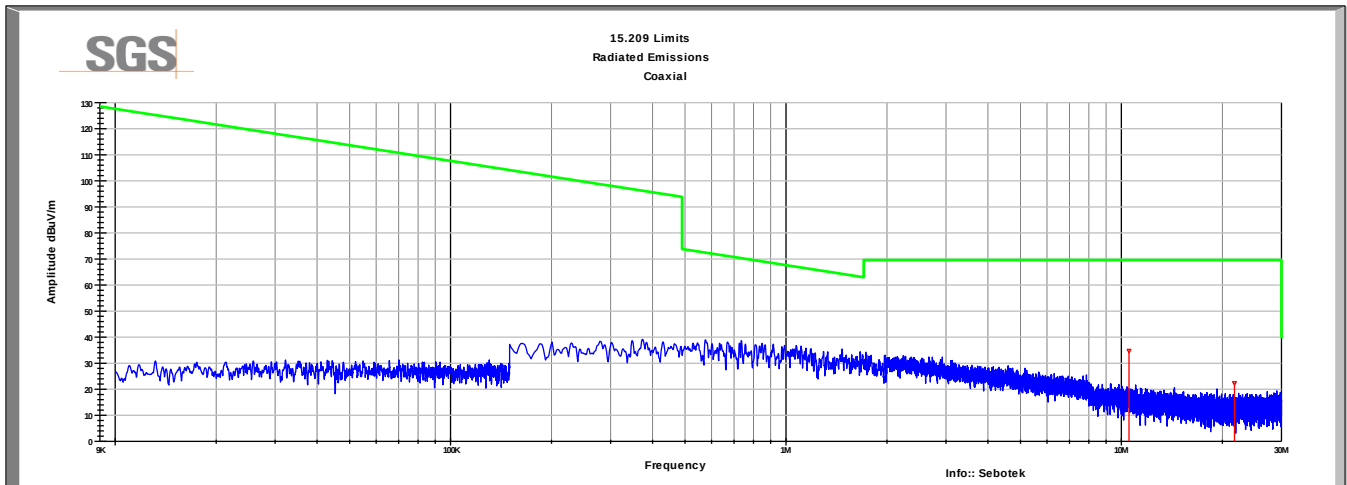
"Radiated Emissions" 30-1000MHz TILE! profile dated 29 June 2014

3.5 Test Data

Co-Planar Radiated Emissions Data (9kHz-30MHz)
 Test Distance: 3m



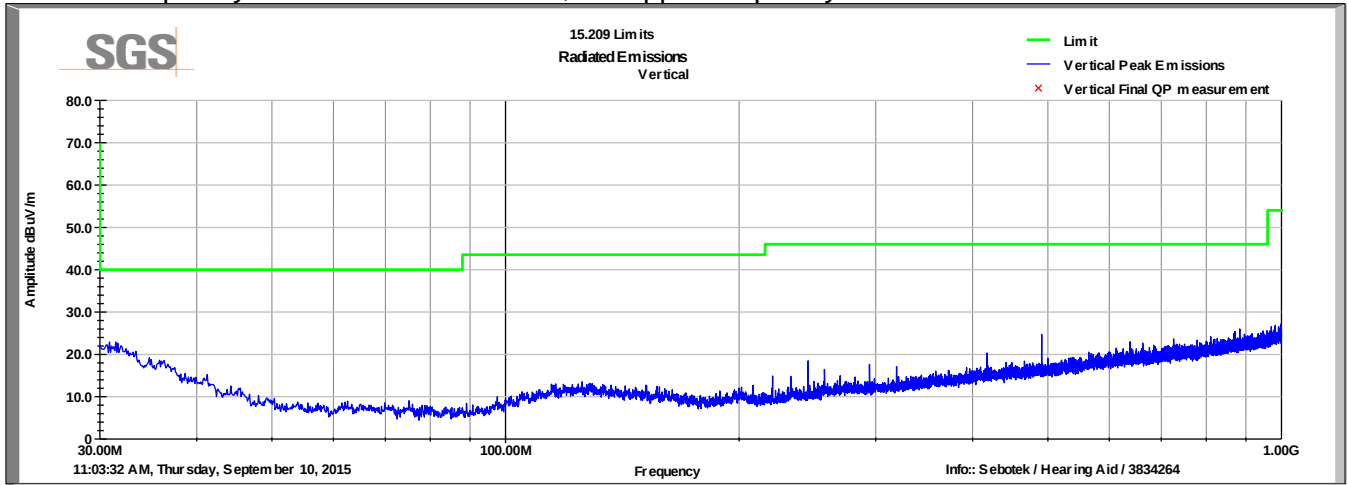
Co-Axial Radiated Emissions Data (9kHz-30MHz)
 Test Distance: 3m



Vertical Radiated Emissions Plot (30-1000MHz)

Test Distance: 3m

Transmit frequency is 10.5 MHz. Therefore, the upper frequency of measurement is 1000 MHz

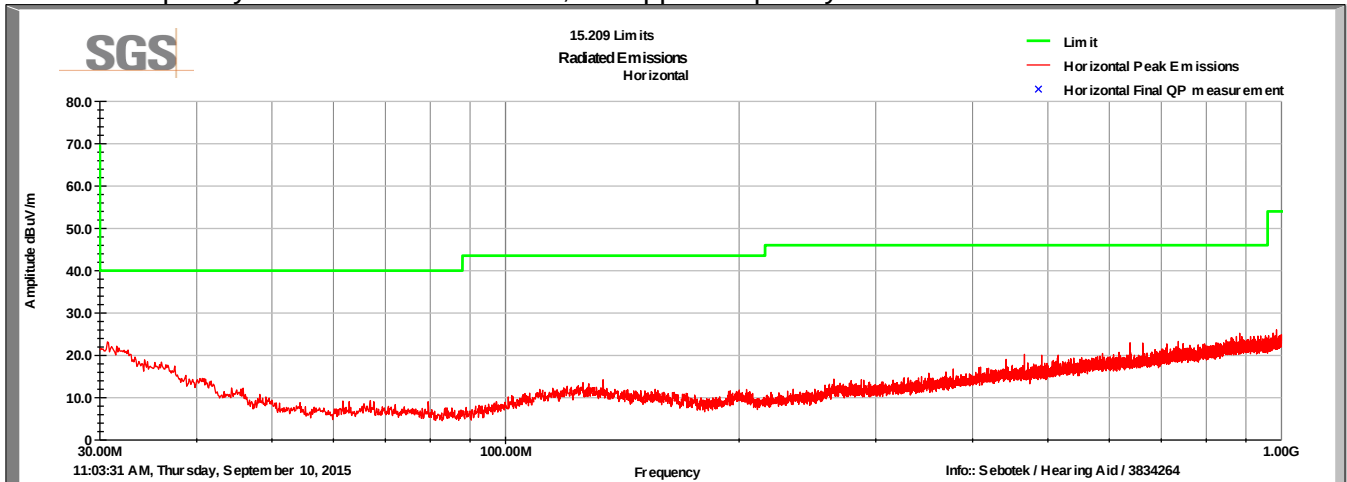


No Emissions within 10dB of limit

Horizontal Radiated Emissions Plot (30-1000MHz)

Test Distance: 3m

Transmit frequency is 10.5 MHz. Therefore, the upper frequency of measurement is 1000 MHz



No Emissions within 10dB of limit

Tabular Data

Frequency MHz	Raw QP (dBuV)	Polarity (CA/CP)	AF (dBS/m)	CL (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10.54	23.6	CA	10.9	0.3	34.7	69.5	-34.8
21.74	12.1	CA	9.9	0.4	22.4	69.5	-47.2
QP Value = Level + AF + CL - Amp							
Margin = QP Value - Limit							

Note: The antenna had to be moved to a 2m distance in order for the transmission to exceed the noise floor. Readings were compared to the 3m limit.

4 Occupied Bandwidth

4.1 Test Result

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

4.2 Test Method

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

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.7 °C
 Relative Humidity: 49.5 %

4.4 Test Data



Date: 10.SEP.2015 10:46:53

Occupied Bandwidth = 568.9kHz

5 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	10 Sep 2015
1	- Corrected IC reference on cover page - Corrected ANSI C63.4 reference on page 6 - Added tabular data for fundamental and second harmonic to page 10	16 Nov 2015