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RF Exposure Evaluation

for the

Siemens Medical Solutions USA, Inc.

ACUSON Freestyle Ultrasound System

FCC ID: XSB2600A

August 8, 2014

WLL Report: 13292-02

Prepared for:

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ACLASS ACCREDITED TESTING

Testing Certificate AT-1448

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Prepared by:

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Reviewed by:

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Abstract

This report has been prepared on behalf of Siemens Medical Solutions USA, Inc. UWB Probes and Receiver to document the findings of the RF evaluation on the Siemens Medical Solutions USA, Inc. UWB Probes and Receiver. The purpose of this evaluation is to establish that this device qualifies for a SAR exclusion under CFR 47 2.1093 in accordance with the procedures of KDB 447498.

This report documents the results of testing to the requirements of:

- CFR Title 47 CFR Sections 1.1307, 2.1091, and 2.1093

References:

- 447498 D01 General RF Exposure Guidance v05r02

The Evaluation was performed by Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Washington Laboratories, Ltd. has been accepted as an EMC Conformity Assessment Body (CAB) under the United States/European Union Memorandum of Agreement. Washington Laboratories, Ltd. is accredited by ACLASS under Testing Certificate AT-1448.

Revision History	Reason	Date
Rev 0	Initial Release	July 31, 2014

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1 Introduction

This report has been prepared on behalf of Siemens Medical Solutions USA, Inc. UWB Probes and Receiver to document the findings of the RF evaluation on the Siemens Medical Solutions USA, Inc. UWB Probes and Receiver. The purpose of this evaluation is to establish that this device qualifies for a SAR exclusion under CFR 47 2.1093 in accordance with the procedures of KDB 447498.

This module will be used in a portable host.

Testing supporting this evaluation was performed at Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Washington Laboratories, Ltd. has been accepted as an EMC Conformity Assessment Body (CAB) under the United States/European Union Memorandum of Agreement. Washington Laboratories, Ltd. is accredited with ACLASS under Testing Certificate AT-1448.

2 Device Details

The ACUSON Freestyle Ultrasound System contains two low powered radios; The host device radio FCC ID: XSB2600A (UWB) and a certified module FCC ID: ED9LMX9838 (Bluetooth). The output power of the UWB transmitter is -20.8dBm/50MHz (9.33µW) and the Bluetooth grant lists the maximum power as 1.63mW.

3 Conditions of Compliance

Platform: The radios are to be used in the ACUSON Freestyle Ultrasound System Handheld Wireless Probes as host.

4 RF Evaluation

4.1 SAR Exclusion

According to KDB 447498 v05r01, Paragraph 4.3.1, *Standalone SAR test exclusion consideration*

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

According to KDB 447498 v05r01, Paragraph 4.3.2, *Simultaneous transmission SAR test exclusion considerations,* section 2, the SAR exclusion formula for antennas located less than <50mm is as follows:

> **When the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:**
>
> > • **[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[$\sqrt{f_{(GHz)}}/x$] W/kg for *test separation distances* ≤ 50 mm; where *x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR.**

4.2 SAR Exclusion Calculations

For this device the antenna to personnel distance will be considered a worst case of 5mm

Maximum power will be 1.63mW (from grant ED9LMX9838).

Maximum peak power measured for the UWB transmitter was 9.33µW/50MHz (from XSB2600A test report). Since the transmitted signal has a bandwidth of 543MHz, a very conservative approach to maximum power would be to integrate the peak power over the entire bandwidth, i.e. 9.33µW/50MHz * 543MHz. This results in a Maximum power of 0.101324mW. Maximum power will be 0.101mW.

The Standalone SAR exclusion for the Bluetooth radio is:

[(*max. power of channel, mW*)/(*min. test separation distance, mm*)] · **[$\sqrt{f_{(GHz)}}$] ≤ 3.0** for 1-g SAR

$$[(1.63/5)] * (\sqrt{2.4}) = 0.51 \leq 3.0$$

The UWB transmitter does not transmit unless the Bluetooth radio is linked and transmitting, therefore Standalone SAR exclusion is not applicable to the UWB radio.

A body SAR reference number of 7.5 will be used (1g-SAR) as this is a handheld device, but can also be used against a body.

Thus:

[(*max. power of channel, mW*)/(*min. test separation distance, mm*)]·[√$f_{(GHz)}$/*x*] W/kg*]* ·

[(1.63/5)* [(√2.4)/7.5] = 0.06733827 W/kg

[(.101/5)* [(√7.535)/7.5] =* 0.007418911 *W/kg

0.06733827 W/kg* + 0.007418911 *W/kg = 0.07 W/kg

0.07 (rounded to 0.1) ≤ 0.4W/kg (EUT is eligible for SAR exclusion)

5 RF Evaluation Summary

As this device complies with the requirements for SAR exclusion, no further RF evaluation or exposure reporting is required.