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## SAR EXCLUSION REPORT

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**Manufacturer:** Structured Mining Systems  
d.b.a. Cervis Inc.  
170 Thorn Hill Road  
Warrendale, Pennsylvania 15086 USA

**Applicant:** Same As Above

**Product Name:** Radio Module

**Product Description:** RT module SRF310 is a PCB assembly ready to be attached to a host application. Host application firmware running on the host microcontroller controls the usage of the RF capabilities supported by the RF transceiver IC in the RT module, including: operational state (on, off, sleep, TX, RX), TX frequency, TX modulation type, TX data and X RF power. The RT module will not generate a TX signal until the host application has properly configured the RF transceiver IC. Certain aspects of the RF IC operation are built into its silicon design, while others are configurable via digital registers. All circuits that pertain to RF signal generation and modulation are isolated from the host application via digital registers. TX settings such as RF frequency and TX power are controlled by settings saved in the non-volatile memory (EE) of the host application and are factory-configured or auto-configured by firmware in the field. Design of the host application firmware ensures that only approved operation occurs. The equipment operator cannot enter TX settings that would result in improper operation. The SRF310 RT module may be implemented with or without additional PCB components that are not related RF circuits, provided that the implementation of the RF section of the RT module is not compromised, and the variant is still a proper RT module. Any changes that are Class 2 permissive will undergo RF testing to prove that the RT module operation has not changed with regards to RF emissions.

**Model:** SRF310

**FCC ID:** LOBSRF310



Order Nos.: F2LQ7361A-C3A, F2LQ7361A-C3A-C1

Client: Cervis Inc.

Model: SRF310

**Standard(s):**

- KDB447498 Section 4.3

**Report Constructed by:**

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## TABLE OF CONTENTS

Section	Title	Page
1	ADMINISTRATIVE INFORMATION	3
2	SUMMARY OF TEST RESULTS/MODIFICATIONS	4
3	ENGINEERING STATEMENT	5
4	EUT INFORMATION AND DATA	6



## 1 ADMINISTRATIVE INFORMATION

### 1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

### 1.2 Document History

Document Number	Description	Issue Date	Approved By
F2LQ7361A-C3A-04E	First Issue	Oct. 27, 2016	K. Littell



Order Nos.: F2LQ7361A-C3A, F2LQ7361A-C3A-C1

Client: Cervis Inc.

Model: SRF310

## 2 SUMMARY OF RESULTS

	Standard(s)	Results
SAR Exclusion	KDB447498, Section 4.3	Complies

Modifications Made to the Equipment
None



### 3 ENGINEERING STATEMENT

This report has been prepared on behalf of Cervis Inc. to provide documentation for the SAR Exclusion herein. This equipment has been tested and found to comply with the SAR Exclusion listed in section 4.3 of KDB447498 based on Duty Cycle.

#### 4.3. General SAR test exclusion guidance

**4.3.1. Standalone SAR test exclusion considerations** Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition(s), listed below, is (are) satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.<sup>28</sup> The minimum test separation distance defined in 4.1 f) is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified, typically in the SAR measurement or SAR analysis report, by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting are required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops and tablets, etc.<sup>29</sup> a) For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR, 30 where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation<sup>31</sup>
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as numeric thresholds

The minimum separation distance used for the calculation is 5mm for extremities ( $<7.5$ ) and 15mm for Body-Worn ( $<3.0$ ). The exclusion is based on the 15% Duty Cycle of the transmitter. To determine the exclusion, the formula  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR was used. The highest Peak output power of 255.27mW EIRP was at the low channel 904 MHz and the Time Averaged Power was 38.3mW. This would make the calculation for extremities be  $(38.3/5) (\sqrt{904}) = 7.28$  which is less than the 7.5 required for SAR Exclusion. The calculation for Body-Worn would be  $(38.3/15) (\sqrt{904}) = 2.43$  which is less than the 3.0 required for SAR Exclusion.



## 4 EUT INFORMATION AND DATA

### 4.1 Equipment Under Test:

Product: Radio Module

Model: SRF310

Serial No.: None Specified

FCC ID: LOBSRF310

### 4.2 Trade Name:

Structured Mining Systems, Inc. d.b.a. Cervis Inc.

### 4.3 Power Supply:

C Batteries

### 4.4 Applicable Rules:

KDB447498

### 4.5 Equipment Category:

Radio Transmitter-DSS

### 4.6 Antenna:

2dBi External Whip

1.4dBi Integral Antenna

### 4.7 Accessories:

N/A