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# Veridt Inc.
# SAR EXEMPTION REPORT

**SCOPE OF WORK**
SAR EXEMPTION CALCULATION
ON THE STEALTH SERIES READER

**REPORT NUMBER**
105986266LEX-003

**ISSUE DATE**
1/23/2025

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14

**DOCUMENT CONTROL NUMBER**
Non-Specific EMC Report Shell Rev. December 2017


# SAR EXEMPTION TEST REPORT

**Report Number:** 105986266LEX-003
**Project Number:** G105986266

**Report Issue Date:** 1/23/2025

**Product Name:** Stealth Series Reader
Model 900W2031

**Standards:** FCC Title 47 CFR Part 2.1093

Tested by:
Intertek Testing Services NA, Inc.
731 Enterprise Drive
Lexington, KY 40510
USA

Client:
Veridt Inc.
7182 US Highway 14 Ste 401
Middleton, WI 53562-4264
USA

Report prepared by

Michael Carlson,
EMC Team Leader

Report reviewed by

Brian Lackey,
Staff Engineer

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## 1 Introduction and Conclusion

SAR exemption calculations were performed on the product constructed as described in section 4. Information provided by the client including maximum output power, antenna gain(s), and minimum separation distance(s) was used to determine if the product under evaluation was exempt from SAR. Any change in these stated values may invalidate these results. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product under evaluation is **exempt** from SAR requirements for each of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) evaluated. Intertek does not make any claims of compliance for samples or variants which were not evaluated.

## 2 Test Summary

| Section | Requirement | Result |
|---|---|---|
| 5 | FCC SAR Exemption Criteria<br>(FCC Title 47 CFR Part 1.1307, 2.1093) | Exempt from SAR |

## 3 Client Information

**This product was tested at the request of the following:**

| Client Information | |
|---|---|
| **Client Name:** | Veridt Inc. |
| **Address:** | 7182 US Highway 14 Ste 401<br>Middleton, WI 53562-4264<br>USA |
| **Contact:** | Mark Depp |
| **Telephone:** | N/A |
| **Email:** | mdepp@veridt.com |
| **Manufacturer Information** | |
| **Manufacturer Name:** | Veridt Inc. |
| **Manufacturer Address:** | 7182 US Highway 14 Ste 401<br>Middleton, WI 53562-4264<br>USA |

## 4 Description of Equipment under Test and Variant Models

| Equipment Under Test | |
|---|---|
| **Product Name** | Stealth Series Reader |
| **Model Number** | 900W2031 |
| **Type of Transmission** | RFID 13.56MHz |
| **Rated RF Output Power** | -2.08dBm |
| **Frequency Range** | 13.56MHz |
| **Type of Modulation / Data Rate** | 424kbps |
| **Number of Channel(s)** | 1 |
| **Description of Equipment Under Test (provided by client)** | |
| The Stealth Series Reader is a mountable card reader that provides secure communications. | |

### 4.1 Variant Models:

There were no variant models covered by this evaluation.

## 4.2 Antenna Separation

No antenna separation information is needed. Exemption based on output power only.

### 4.3 Maximum Output Power

The following information was provided by direct measurement.

### 4.4 Method:

The test sample was mounted to an insulating support structure 150cm high on a turntable capable of rotating from 0 to 360 degrees about the vertical axis. For smaller test samples which could be used in multiple orientations, the support structure used was capable of rotating the test sample about the horizontal axis in order to fully optimize the direction of the spurious emission.

A connection was established to a base station simulator which was used to set the test sample to the middle channel at maximum output power. This connection was made "over the air".

Measurements were performed using a pre-calibrated substitution method with the receiving antenna polarized vertically as well as horizontally. For frequencies above 1GHz, RF absorber was in place in order to create a free space environment, and the receive antenna was fixed at 150cm in height. For frequencies below 1GHz, no RF absorber was present, and the receive antenna was scanned from 1m to 4m in height in order to maximize the spurious emission. The device was tested in normal as well as extreme voltage conditions (NV, LV, HV) as dictated by the standard test method. No significant change was found when testing at Low Voltage and High Voltage; therefore all reported data is from testing at Normal Voltage.

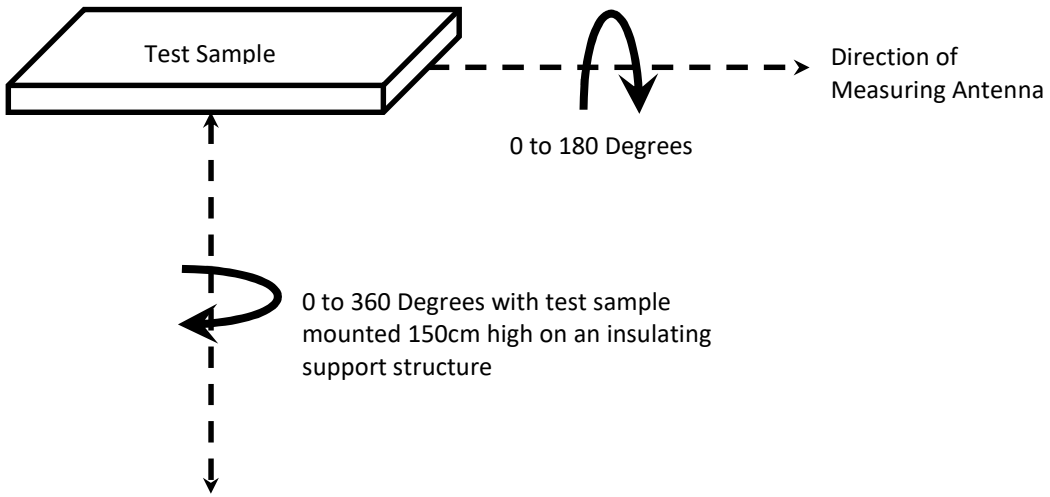



**Figure 1: Illustration of the Rotation of the Test Sample**

## 4.5 Sample Calculation:

The radiated spurious emission power measurement is calculated using the Pre-Substitution method described in ETSI TS 103 052 V1.1.1. The final radiated power measurement is calculated by taking the spectrum analyzer reading in dBμV and adding a correction factor that includes, cable loss, preamp gain, over the air path loss, and a subtraction of 107 to convert from dBμV to dBm. The basic process with a sample calculation is shown below.

| | |
|---|---|
| RP = SA + Corr | SA = Spectrum Analyzer Reading (dBμV)<br>RP = Radiated Power (dBm)<br>Corr = Correction Factor (dB) |
| Corr = rxCF + rxPG + PL – 107 | rxCF = Receive Cable Factor (dB)<br>rxPG = Receive Preamp Gain (dB)<br>PL = Path Loss (dB) |

The path loss is measured prior to testing using the substitution method. This method can be done with a signal generator and a separate spectrum analyzer, or simply a network analyzer. In this method, the device is substituted with a transmitting antenna with known correction factors. First the cables for the transmit and receive antennas are connected directly to establish a baseline. After this, the cables are disconnected and both antennas are re-attached and set in their measurement positions. The path loss factor used for the final measurement can then be obtained using the following equation.

| | |
|---|---|
| PL = SG – txCF – txAG | PL = Path Loss (dB)<br>SG = Signal Generator Level (dBm)<br>txCF = Transmit Cable Factor (dB)<br>txAG = Transmit Antenna Gain (dBi) |

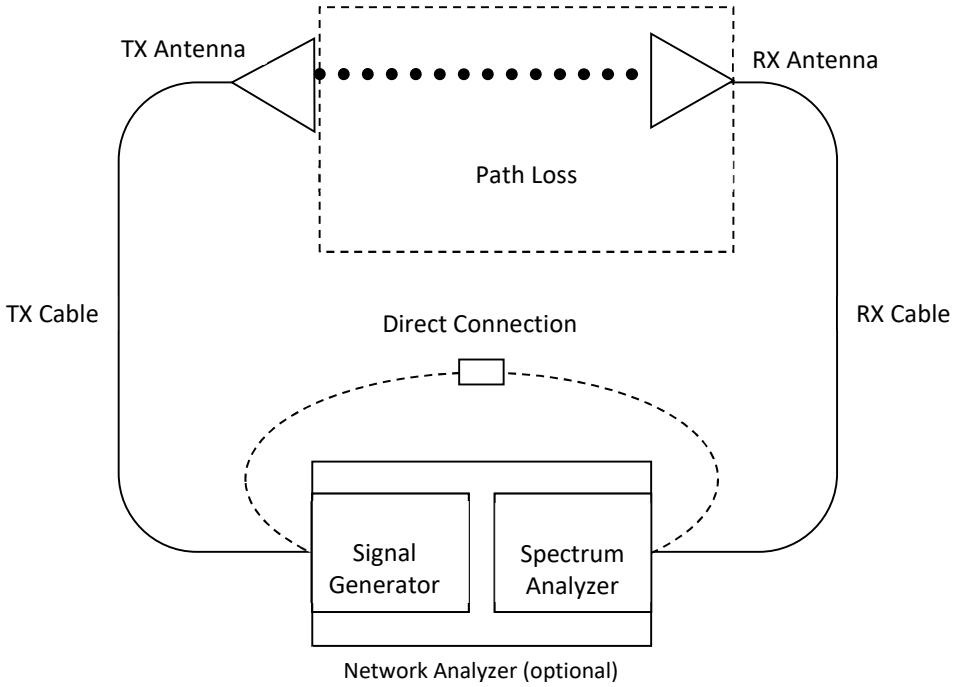
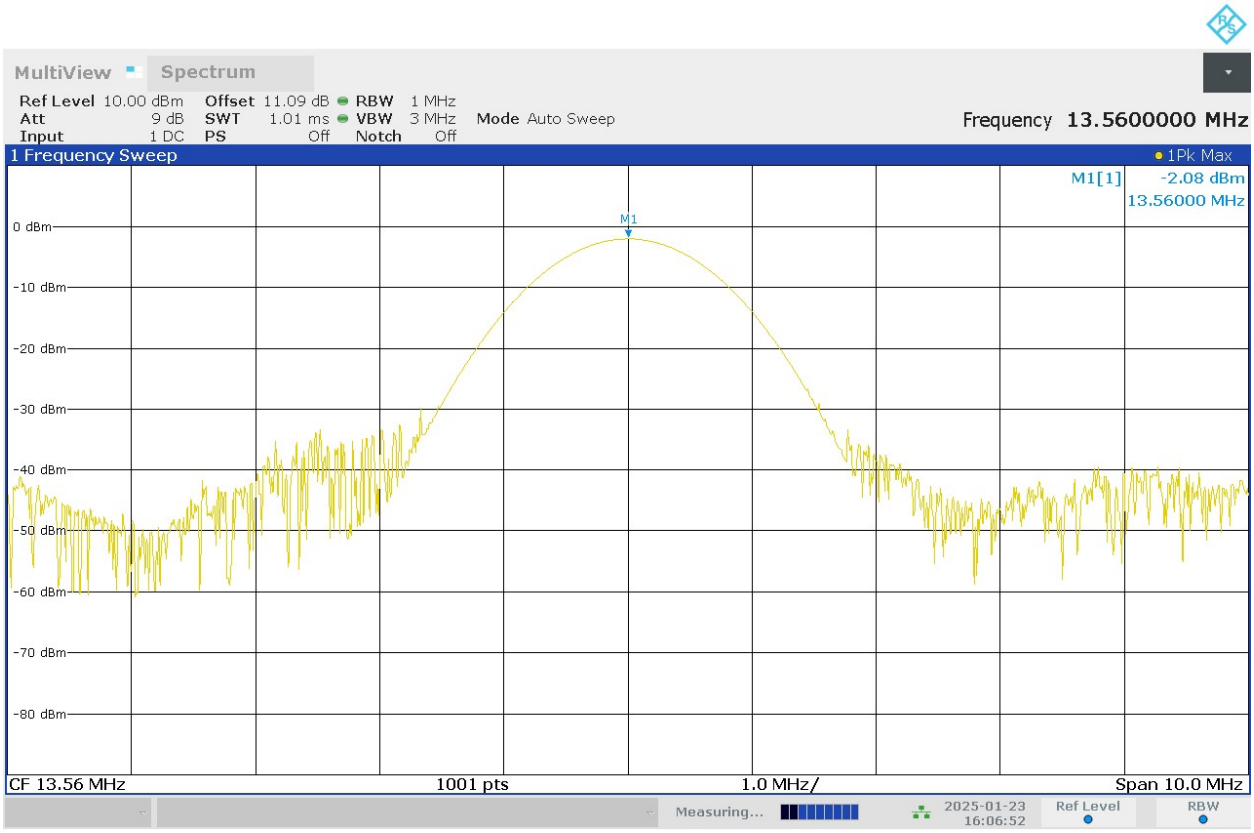



**Figure 2: Illustration of the Substitution Calculation for the Path Loss**

Assuming we measure 39.59dBμV at the spectrum analyzer. Subtract 107 to arrive at a value in dBm, then add in our correction factors of cable loss 6.2dB, preamplifier gain -34dB, and the pre-calculated path loss of 44.7dB.

**Example:**
RP = SA – 107 + rxCF + rxPG + PL = 39.59 – 107 + 6.2 – 34 + 44.7 = -50.51dBm

Output Power = -2.08 dBm

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### 4.6 Test Equipment Used:

| Description | Asset | Manufacturer | Model | Cal Date | Cal Due |
|---|---|---|---|---|---|
| EMI Test Receiver | 8258 | Rohde & Schwarz | ESW44 | 10/10/2024 | 10/10/2025 |
| 30M-1G 3m Signal Path without Preamplifier | 8311 2593 8188 8185 | - | - | 11/26/2024 | 11/26/2025 |
| Magnetic Loop Antenna | 2366 | ETS | 6502 | 9/16/2024 | 9/16/2025 |

### 4.7 Software Utilized:

| Name | Manufacturer | Version |
|---|---|---|
| RS Commander | Rohde & Schwarz | Version 10.60.20 |

## 5 FCC SAR Exemption Criteria

**FCC Title 47 CFR Part 1.1307(3)(i):**

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

$d$ = the separation distance (cm);

| RF Source | Frequency (MHz) | Output Power (dBm) | Output Power (mW) | Exempt from SAR? |
|---|---|---|---|---|
| RFID | 13.56 | -2.08 | 0.619 | Exempt |

The output power is not more than 1mW. The device is exempt per FCC Title 47 CFR Part 1.1307(3)(i)(A).

## 6 Revision History

| Revision Level | Date | Report Number | Prepared By | Reviewed By | Notes |
|---|---|---|---|---|---|
| 0 | 1/23/2025 | 105986266LEX-003 | MC | BL | Original Issue |
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