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Veridt Inc. TEST REPORT

SCOPE OF WORK

EMC TESTING – STEALTH SERIES READER

REPORT NUMBER

105986266LEX-002.1

ISSUE DATE

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EMC TEST REPORT
(FULL COMPLIANCE)

Report Number: 105986266LEX-002.1

Project Number: G105986266

Report Issue Date: 1/23/2025

Report Revise Date: 3/19/2025

Model(s) Tested: Stealth Series Reader

Standards: FCC Title 47 CFR Part 15.225

RSS-210 Issue 10

RSS-GEN Issue 5

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

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

Report prepared by



Leo Richter,
EMC Engineer

Report reviewed by



Michael Carlson,
Team Leader

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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. 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 tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
6	Occupied Bandwidth (ANSI C63.10 (2020) §6.9.3)	Pass
7	Radiated Spurious Emissions (ANSI C63.10 (2020) §6.3, §6.4, and §6.5)	Pass
8	Frequency Stability (ANSI C63.10 (2020) § 6.8)	Pass
9	Antenna Requirement (FCC Part 15.203, RSS-Gen Issue 5 § 6.8)	Pass



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 Middleton, WI 53562-4264 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 Middleton, WI 53562-4264 USA



4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	Stealth Series Reader
Model Number	900W2031
Serial Number	CC0A240011
Receive Date	8/20/2024
Test Start Date	11/4/2024
Test End Date	11/22/2024
Device Received Condition	Good
Test Sample Type	Production
Transmit Frequency	13.56MHz
Antenna Type	Integral Antenna
Rated Voltage	12VDC
Description of Equipment Under Test (provided by client)	
The Stealth Series Reader is a mountable card reader that provides secure communication.	

4.1 Variant Models:

There were no variant models covered under this evaluation.



5 System Setup and Method

5.1 Method:

Configuration as required by ANSI C63.10 (2020)

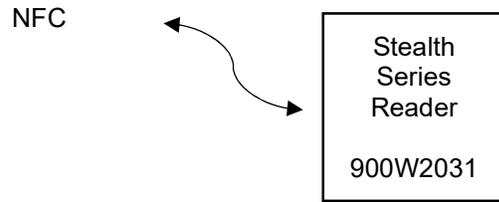
No.	Descriptions of EUT Exercising
1	The EUT was powered by a 12VDC power supply and transmitting at 13.56MHz continuously.

Cables					
QTY	Description	Length (m)	Shielding	Ferrites	Termination
1	DC Power	1	None	None	DC Supply

Support Equipment (Accessories)		
Description	Manufacturer	Model Number
-	-	-



5.2 EUT Block Diagram:
Stealth Series Reader





6 Occupied Bandwidth

6.1 Test Method:

Tests are performed in accordance with ANSI C63.10 (2020) §6.9.3.

6.2 Test Limits:

Title 47 CFR 15.215(c):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

RSS-GEN §6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.



6.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	10/10/2024	10/10/2025

6.4 Test Software Used:

Description	Manufacturer	Version
RSCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

6.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Automatic Bandwidth Measurement	2.89%

No measurement correction based on measurement uncertainty is performed.

6.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Brian Lackey	N/A	11/22/2024	23.3°C	33.8%	982.0mbar

6.7 Test Results:

The sample tested was found to Comply. The 20dB and 99% bandwidths were contained completely within the authorized band.

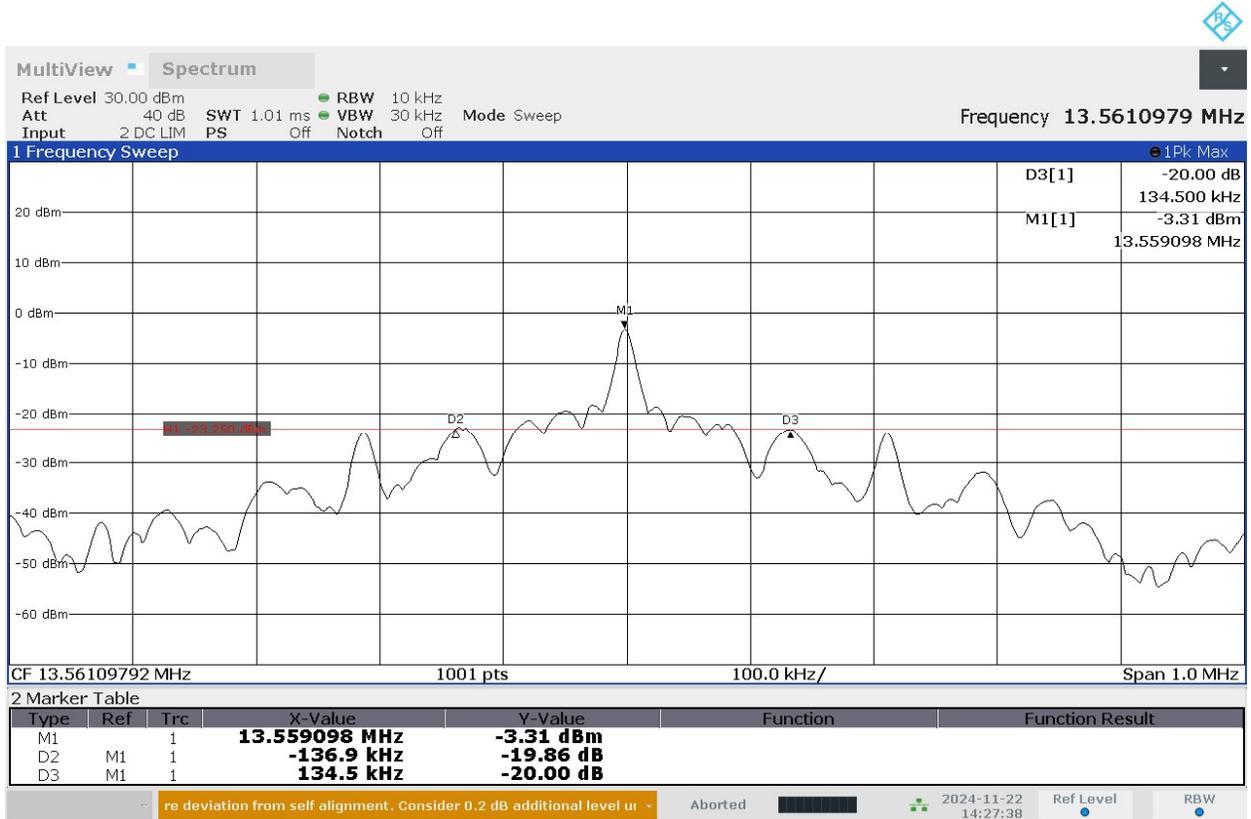


6.8 Test Data:

Bandwidth	F_{low} (MHz)	F_{high} (MHz)	Bandwidth (kHz)
20dB	13.4221	13.6935	271.4
99%	13.3419	13.7792	437.3



6.9 Test Plots: Occupied Bandwidth 6.9.1 20dB

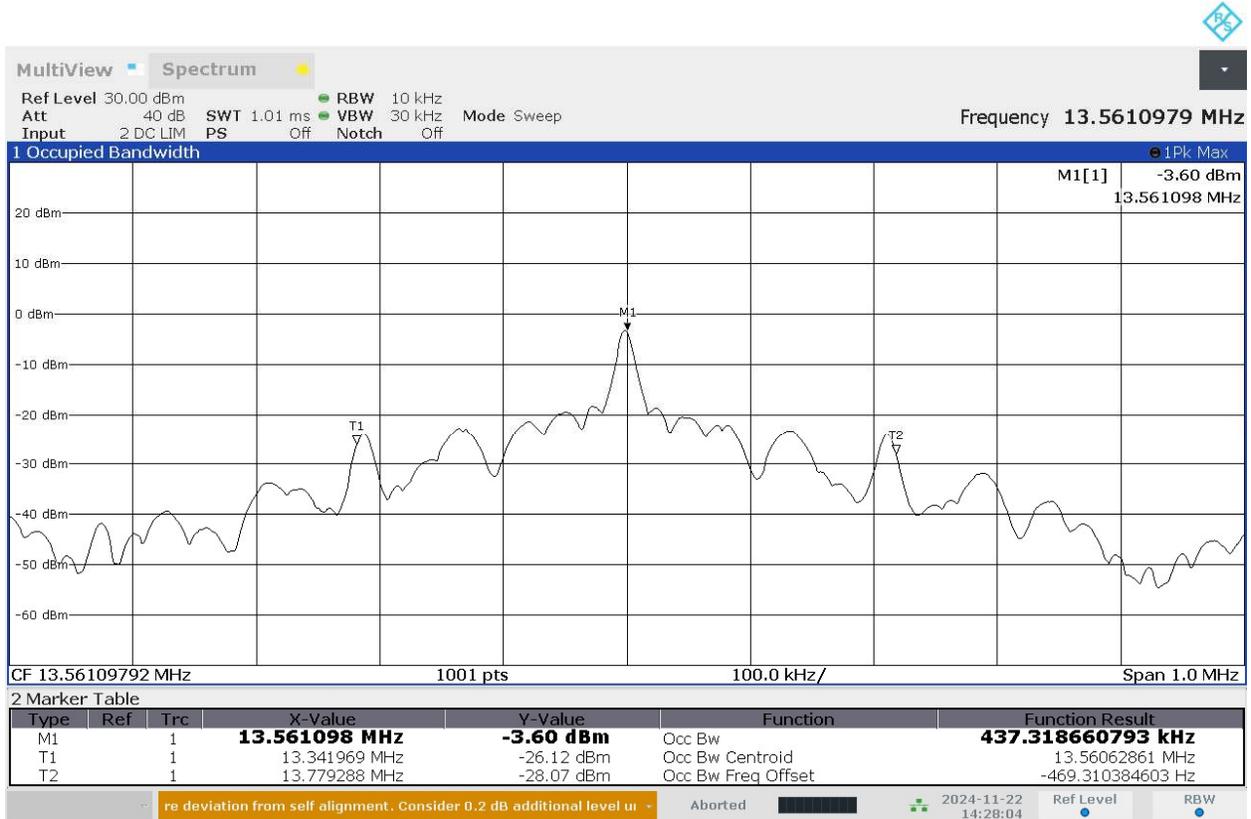


02:27:39 PM 11/22/2024

Figure 1 – 20dB Bandwidth



6.9.2 99% Occupied Power Bandwidth



02:28:05 PM 11/22/2024

Figure 2 – 99% Occupied Power Bandwidth



7 Radiated Spurious Emissions

7.1 Test Method:

Tests are performed in accordance with ANSI C63.10 (2020) §6.3, §6.4, and §6.5.

7.2 Test Limits:

47 CFR 15.225(a)-(d):

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

RSS-210 Issue 10 § B.6(a)(i)-(iv):

- (a) the field strength of any emission shall not exceed the following limits:
 - (i) 15.848 mV/m (84 dB μ V/m) at 30 m, within the band 13.553-13.567 MHz
 - (ii) 334 μ V/m (50.5 dB μ V/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz
 - (iii) 106 μ V/m (40.5 dB μ V/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz
 - (iv) RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz



7.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	10/10/2024	10/10/2025
Bilog Antenna	7085	SunAR	JB6	3/18/2024	3/18/2025
Magnetic Loop Antenna	2366	ETS	6502	9/16/2024	9/16/2025
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
30M-1G 3m Signal Path without Preamplifier	3339, 2592, 8188, 8185			1/12/2024	1/12/2025

7.4 Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	3.9dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	4.0dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.7dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	4.7dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.

7.5 Test Software Used:

Description	Manufacturer	Version
EMC32	Rohde & Schwarz	10.60.20

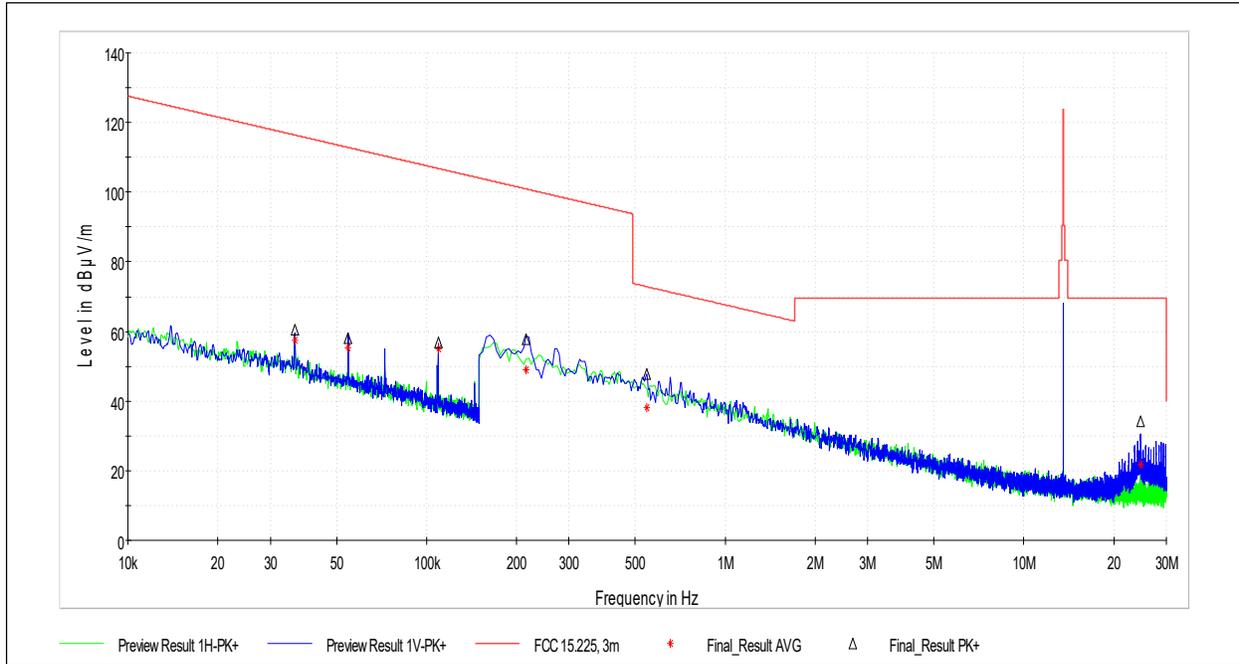
7.6 Test Results:

The sample tested was found to Comply. The device was investigated in three orthogonal axes.



7.7 Test Data: Radiated Spurious Emissions, General

7.7.1 Frequency Range 9kHz – 30MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.036200	60.42	---	---	100.0	V	109.0	14.0
0.054700	58.17	---	---	100.0	V	7.0	12.8
0.109500	56.77	---	---	100.0	V	0.0	12.2
0.215846	57.69	---	---	100.0	V	264.0	12.0
0.545074	47.86	---	---	100.0	V	212.0	11.9
24.543596	34.05	---	---	100.0	V	294.0	9.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.036200	57.52	116.42	58.90	100.0	V	109.0	14.0
0.054700	55.30	112.83	57.53	100.0	V	7.0	12.8
0.109500	55.10	106.81	51.71	100.0	V	0.0	12.2
0.215846	48.97	100.92	51.95	100.0	V	264.0	12.0
0.545074	37.97	72.88	34.90	100.0	V	212.0	11.9
24.543596	21.65	69.50	47.85	100.0	V	294.0	9.9

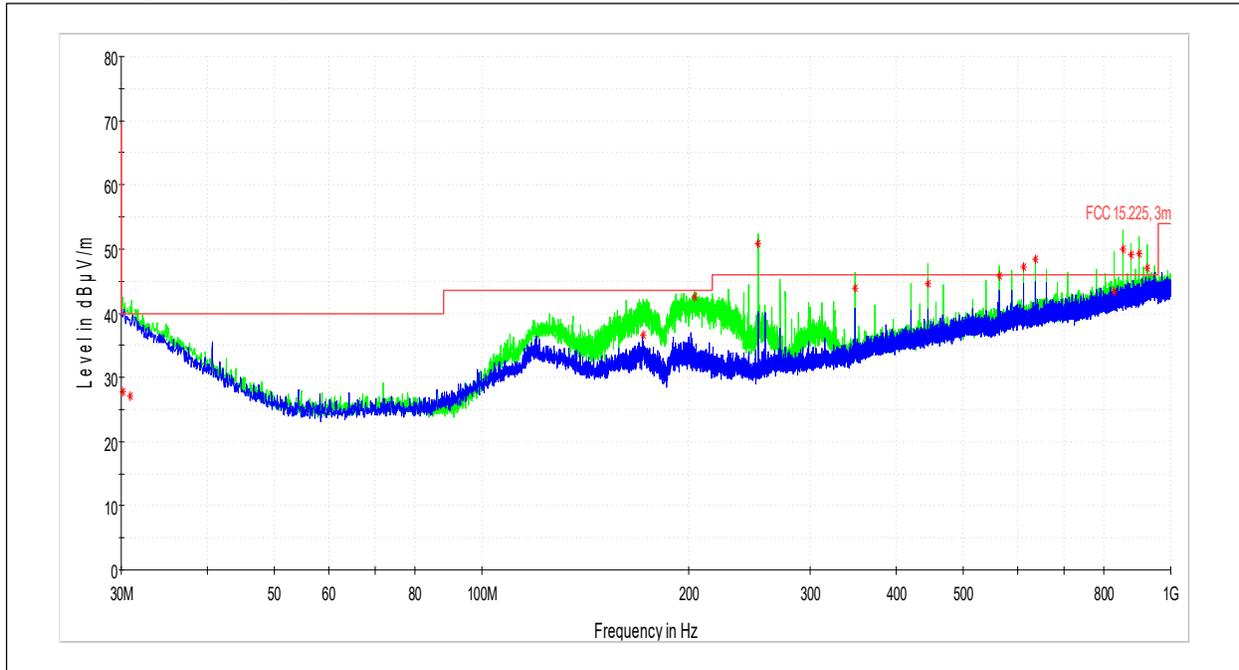
Test Personnel: Leo Richter
 Supervising/Reviewing Engineer: _____
 (Where Applicable) N/A
 Product Standard: FCC 15.225
RSS-210
 Input Voltage: 12VDC

Test Date: 11/4/2024
 Limit Applied: See Section 7.2
 Ambient Temperature: 24.1°C
 Relative Humidity: 45.6%
 Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: Peak emissions were below the quasi-peak limit and the device is deemed to comply.



7.7.2 Frequency Range 30MHz – 1GHz



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.161667	27.78	40.00	12.22	214.0	H	276.0	28.4
30.916111	27.06	40.00	12.94	242.0	H	15.0	27.8
171.512222	36.69	43.50	6.81	173.0	H	39.0	19.3
203.522222	42.51	43.50	0.99	133.0	H	254.0	20.0
251.968333*	50.84	56.90	6.06	114.0	H	245.0	19.8
347.998333	43.96	46.00	2.04	97.0	H	313.0	23.0
443.974444	44.66	46.00	1.34	214.0	H	0.0	25.3
563.985000	45.89	46.00	0.11	156.0	H	58.0	27.4
612.000000*	47.17	56.90	9.73	120.0	H	207.0	28.4
635.980556*	48.38	56.90	8.52	150.0	H	94.0	28.6
828.040556	43.46	46.00	2.54	95.0	H	7.0	31.4
852.021111*	49.92	56.90	6.98	95.0	H	7.0	31.6
876.001667*	49.04	56.90	7.83	95.0	H	344.0	31.7
899.982222*	49.35	56.90	7.55	97.0	H	346.0	32.0
924.016667*	47.06	56.90	9.84	97.0	H	334.0	32.2

Test Personnel: Leo Richter
 Supervising/Reviewing Engineer: _____
 (Where Applicable) N/A
 FCC 15.225
 Product Standard: RSS-210
 Input Voltage: 12VDC

Test Date: 11/4/2024
 Limit Applied: See Section 7.2
 Ambient Temperature: 24.1°C
 Relative Humidity: 45.6%
 Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: *The emissions above the limit were further investigated and found to be due to the normal operation of the device, which meets the class A unintentional radiator limits. The investigation was done by measuring the emissions, turning off the radio, and noting any change in measured value. No change in value demonstrates the emissions are due to normal operation and not due to the radio. The appropriate limit was applied in the table above.



8 Frequency Stability

8.1 Test Method:

Tests are performed in accordance with ANSI C63.10 (2020) § 6.8.1. Testing was performed with 12VDC power supply.

8.2 Test Limits:

Title 47 CFR Part 15.225(e):

(e) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+ 50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

RSS-210 Issue 10 § B.6(b):

(b) the carrier frequency stability shall not exceed ± 100 ppm

8.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Spectrum Analyzer	3099	Rohde & Schwarz	FSP7	09/20/2024	09/19/2025

8.4 Test Software Used:

Description	Manufacturer	Version
RSCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

8.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Reference Frequency Uncertainty	0.0120 Hz

No measurement correction based on measurement uncertainty is performed.

8.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Leo Richter	David Perry	11/6/2024	20.8°C	63.1%	985.4mbar

8.7 Test Results:

The sample tested was found to Comply. The frequency was maintained to within $\pm 0.01\%$ and ± 100 ppm.

**8.8 Test Data:**

Temperature (C)	Frequency (MHz)	Frequency (Hz)	Deviation (Hz)	Deviation (%)	Deviation (ppm)
-20	13.561195952	13561195.952	-111.664	0.0008%	8.2341
-10	13.561180000	13561180.000	-95.712	0.0007%	7.0578
0	13.561156072	13561156.072	-71.784	0.0005%	5.2934
10	13.561130150	13561130.150	-45.862	0.0003%	3.3819
20	13.561084288	13561084.288	-	-	-
30	13.561054378	13561054.378	29.910	-0.0002%	-2.2056
40	13.561028456	13561028.456	55.832	-0.0004%	-4.1171
50	13.561012504	13561012.504	71.784	-0.0005%	-5.2934

Nominal Voltage (V)	Relative Voltage (%)	Test Voltage (V)	Frequency (MHz)	Deviation (Hz)	Deviation (%)	Deviation (ppm)
12	85	10.2	13.562	0	0	0
12	100	12	13.562	-	-	-
12	115	13.8	13.562	0	0	0



9 Antenna Requirement

9.1 Test Limits

FCC Part 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

RSS-Gen Issue 5 § 6.8:

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

9.2 Test Results

The device was found to be **compliant**. The device has an internal, permanently affixed antenna.



10 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	1/23/2025	105986266LEX-002	LAR	MC	Original Issue
1	3/19/2025	105986266LEX-002.1	LAR	MC	Added more detailed explanation in section 7