



Test Report –RF Exposure

Prepared For: Guard RFID Solutions Inc.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 6/16/2021

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Timco Engineering, Inc., an IIA Company
849 NW State Road 45, Newberry, Florida 32669
(352) 472-5500 / testing@timcoengr.com

1. Customer Information

Applicant: Guard RFID Solutions Inc.
Address: +140-766 Cliveden Place
Delta BC V3M 6C7
Canada

1.1 Test Result Summary

The following test procedure was used ISED RSS-102 Issue 5. Full test results are available in this report.

No additions to the test methods were needed. There were no deviations, or exclusions from the test methods. No test results are from external providers or from the customer. The test results relate only to the items tested. Timco does not offer opinions and interpretations, only a pass/fail statement.

Clauses	Description of the Requirements	Result (Pass, Fail or N/A)
SPR-002, Issue 1	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)	Pass
680106 D01 RF Exposure Wireless Charging App v03r01	Rf Exposure Considerations For Low Power Consumer Wireless Power Transfer Applications	Pass

2. Location of Testing

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780

FCC Designation # US1070

FCC site registration is under A2LA certificate # 0955.01

ISED Canada test site registration # 2056A

EU Notified Body # 1177

For all designations see A2LA scope # 0955.01



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2.2 Testing was performed, reviewed by

Dates of Testing: 6/14/2021

Signature:

Sr. EMC Engineer
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

6/16/2021

3. Test Sample(s) (EUT/DUT)

The test sample was received: 6/16/2021

3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
Brief Description	WiFi Tag Charger
Reference	LABTEST 20237
Type of Modular	n/a
FCC ID #	VZKWTC
Model(s) #	WIRELESS CHARGER ST-4
Firmware version	n/a
Software version	n/a
Serial Number	100002

Technical Characteristics	
Technology	WiFi Tag Charger
Frequency Range	136.547 to 144.051kHz
Antenna Type	Integral/PCB
Voltage Rating (AC or Batt.)	5VDC, 5.0A



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3.1 Configuration of EUT

Configuration	Band	Mode
1	136.547 to 144.051kHz	Operational

Operating conditions during Testing:

No modifications of the device under test (including firmware, specific software settings, and input/output signal levels to the EUT).

Peripherals used during Testing:

A Laptop PC was used to power and control the EUT. Four configuration modes were available in the software, but only 2 were utilized.

4. Test methods & Applicable Regulatory Limits

4.1 Test methods/Standards/Guidance

The measurement was performed as per RSS-102. Full test results are available in this report.

4.1.1 Limits for Maximum Permissible Exposure (MPE)

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
* Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

20 Compliance measurements are carried out while the device under test is generally configured to continuously transmit at its highest output power. In addition, the SAR measurement procedures adopted within this standard ensure that the exposure intensity variations are within the standardized power fluctuation requirements. Therefore, the six-minute time-averaging is not required when demonstrating compliance with the applicable localized SAR limits for the device under test.

21 For provisions related to instantaneous nerve stimulation measurements see [Notice 2015-DRS001](#).



4.2 Test Equipment List

Device	Manufacturer	Model	SN #	Current Cal	Cal Due
E-Field, H-Field, B-Field Probe Handheld Meter	WaveControl	SMP2	20SN1400	8/19/20	8/19/2023
E-Field Probe - 100 kHz to 8 GHz	WaveControl	WPF8	20WP041171	8/19/20	8/19/2023
E-Field & B-Field Probe - 10 Hz to 400 kHz	WaveControl	WP400	20WP100701	8/21/20	8/21/2023
H-Field Probe - 300 kHz to 60 MHz	WaveControl	WPH60	20WP110071	8/20/20	8/20/2023

4.3 Equations

POWER DENSITY

$$E(V/m) = \text{SQRT} (30 * P * G) / d$$

$$Pd(W/m^2) = E^2 / 377$$

$$S = \text{EIRP} / (4 * \text{Pi} * D^2)$$

Where:

S = Power density, in mW/cm²

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm² to units of W/m² by multiplying by 10.

DISTANCE

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

Where:

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power, in mW

S = Power density in mW/cm²

SOURCE-BASED DUTY CYCLE (When applicable (for example, multi-slot mobile phone applications) A duty cycle factor may be applied.)

$$\text{Source-based time-average EIRP} = (\text{DC} / 100) * \text{EIRP}$$

Where:

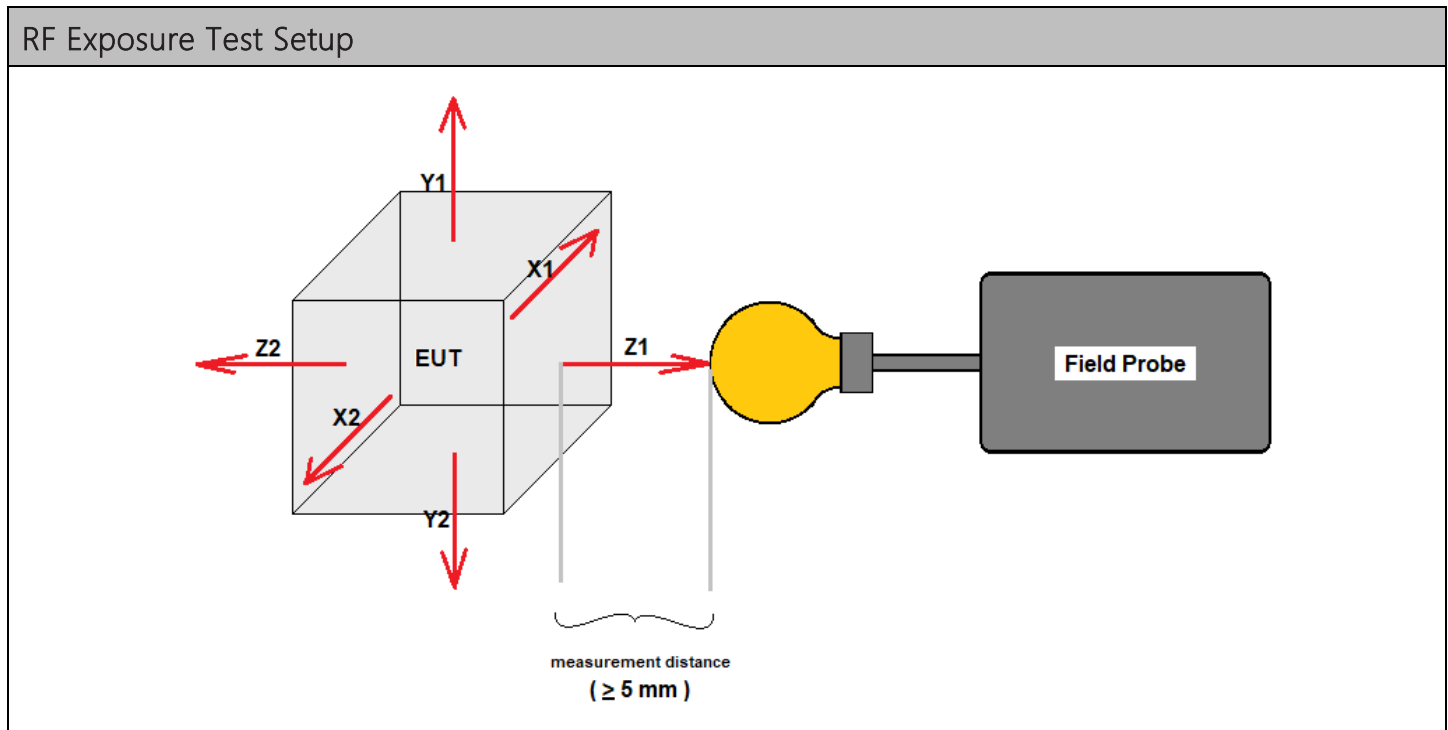
DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW

5. RF Exposure

5.1 Near Field Measurement

Requirement and Limits from RSS-102. A pre-scan of all usable axes was conducted, and the worst case axis was used for each configuration.



Note: Axes X1, X2, Z1, and Z2 were evaluated, but are not practically useable for this EUT.

Note: Measurements were carried out at a distance of 5 mm.

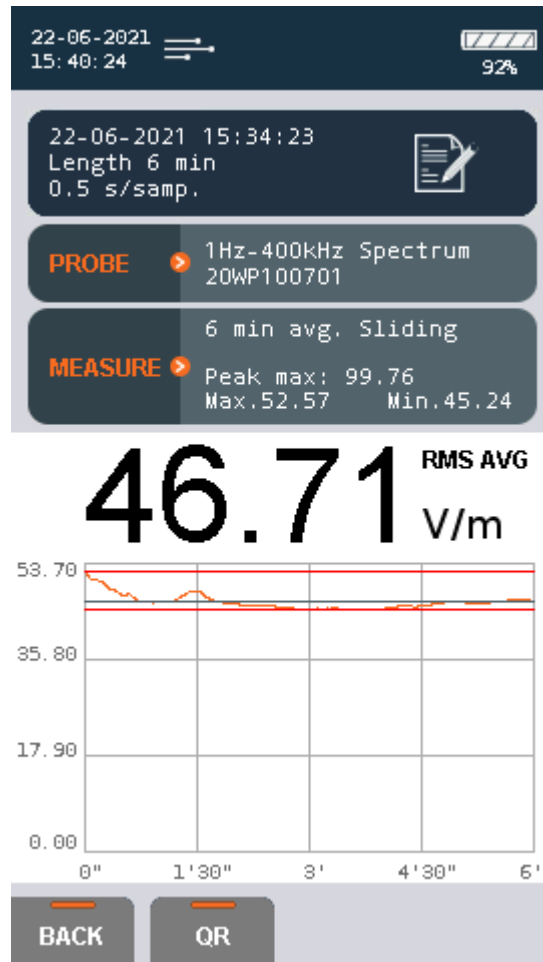
Note: Averaging time for all measurements was 6 minutes.



5.1.1 0.001 – 400 kHz, Configuration 1, E-Field

Configuration	Worst-case Orientation Axis
1	Y1

Test Data



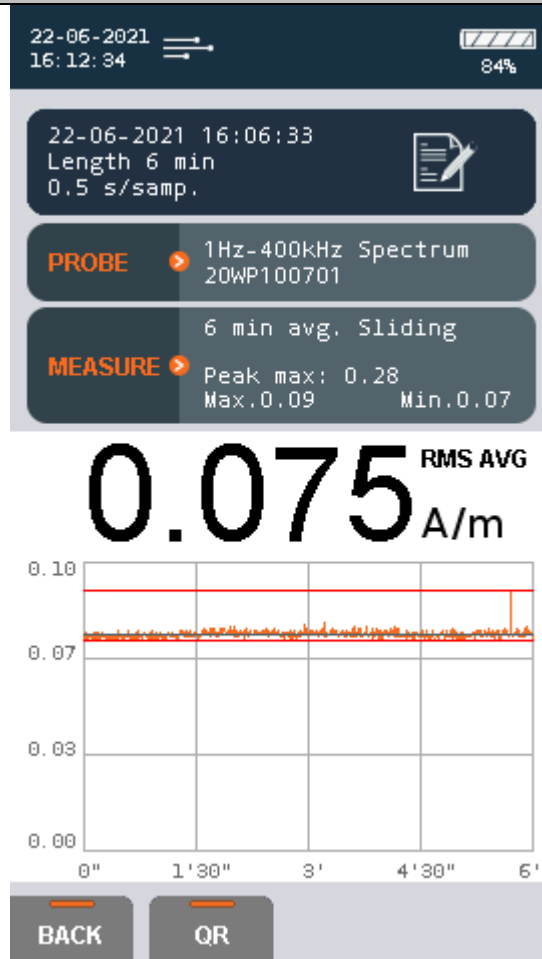
Tested at 20cm



5.1.2 0.001 – 400 kHz, Configuration 1, H-Field

Configuration	Worst-case Orientation Axis
1	Y1

Test Data





5.1.3 0.001 – 400 kHz, Configuration 1, B-Field

Configuration	Worst-case Orientation Axis
1	Y1





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6. ANNEX-A – Test Setup Photographs

Test setup photographs are located in a separate document.

7. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
3009-21_RSS102(NS)_ 1	1	Initial release	6/16/2021
	2	Updated pages 9-11	June 22, 2021
	3	Corrected FCC ID	July 7, 2021



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END OF TEST REPORT
