

Haws Corporation

RF Exposure Exemption Report

SCOPE OF WORK

RF Exposure Exemption Evaluation – RFID Radio Module, Model: 0210000745

REPORT NUMBER

104901690MPK-003

ISSUE DATE

March 01, 2022

REVISED DATE

N/A

PAGES

9

DOCUMENT CONTROL NUMBER

Non-Specific Radio Report Shell Rev. December 2017
© 2017 INTERTEK



RF Exposure Exemption Evaluation Report
(FULL COMPLIANCE)

Report Number: 104901690MPK-003

Project Number: G104901690

Report Issue Date: March 01, 2022

Product Designation: RFID Radio Module

Model(s) Tested: 0210000745

FCC ID: 2AUAN-12XXSM

IC: 25359-12XXSM

Standards: 47CFR 1.1307(b)(3)
RSS-102 Issue 5

for

Haws Corporation

Tested by:

Intertek
1365 Adams Court
Menlo Park, CA 94025 USA

Client:

Haws Corporation
1455 Kleppe Lane
Sparks, NV 89431 USA

Report prepared by:



Gerardo Narvaez / Project Engineer

Report reviewed by:



Krishna Vemuri / EMC Manager

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Table of Contents

Haws Corporation 1

1 Introduction and Conclusion 4

2 Evaluation Summary 4

3 Client Information 5

4 Description of Equipment Under Test and Variant Models 5

5 RF Exposure Exemption Evaluation (FCC) 6

6 RF Exposure Exemption Evaluation (ISED) 9

7 Revision History 11

1 Introduction and Conclusion

This evaluation report covers for a medical implant device subject to routine environmental evaluation for RF exposure.

The evaluation indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining sections are the verbatim text from the actual evaluation during the investigation. These sections include the evaluation name, the specified Method, and 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 evaluated **complies** with the requirements of the standard(s) indicated. The results obtained in this 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 Evaluation Summary

Section	Test full name	Result
3	Client Information	-
4	Description of Equipment Under Evaluation and Variant Models	-
5	FCC SAR Test Exclusion	Compliant
6	ISED Canada SAR Test Exclusion	Compliant
7	Revision History	-

3 Client Information

This EUT was evaluated at the request of:

Client: Haws Corporation
1455 Kleppe Lane
Sparks, NV 89431 USA

Contact: Sam Hong
Telephone: 775-772-9235
Email: samh@hawsco.com

4 Description of Equipment Under Test and Variant Models

Description of Equipment Under Test (provided by client)

The equipment under test (EUT), Haws Corporation RFID Radio Module (IPG), model: 0210000745.

The RFID radio module is designed to be used in Haws Corporation water coolers as part of its water filter monitoring function.

Variant Models:

The following variant models have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

- None

5 RF Exposure Exemption Evaluation (FCC)

5.1 Determination of exemption [FCC 1.1307(b)(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 P_{th} (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). P_{th} is given by;

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

Where

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

and

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

d = the separation distance (cm);

- (C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3 – 1.34	1,920 R ²
1.34 – 30	3,450 R ² /f ²
30 – 300	3.83 R ²
300 – 1,500	0.0128 R ² f
1,500 – 100,000	19.2 R ²

(ii) For multiple RF sources: Multiple RF sources are exempt if:

- (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
- (B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

P_{th,i} = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i*.

ERP_j = the ERP of fixed, mobile, or portable RF source *j*.

ERP_{th,j} = exemption threshold ERP for fixed, mobile, or portable RF source *j*, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluated_k = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limit_k = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k*, as applicable from § 1.1310 of this chapter.

5.2 Exemption Evaluation

Frequency (MHz)	Max Field Strength @ 10m (dB (uV/m))	EIRP dBm	Note
13.56	43.95	-40.82	Field Strength measurements were taken from Report # 104901690MPK-001

The maximum EIRP of -40.82 dBm (0.0001 mW) is less than 1 mW. According to FCC §1.1307(b)(3)(i), the device is exempt in fixed, mobile, or portable device exposure conditions

5.3 Evaluation Results

The sample evaluated was found to Comply. The maximum conducted power is less than 1 mW.

6 RF Exposure Exemption Evaluation (ISED)

6.1 Determination of exemption [RSS-102 Section 2.5.1]

According to RSS-102 Section 2.5.1, at frequency ≤ 300 MHz and separation distance of ≤ 5 mm SAR Exemption limit is 71 mW (see table below).

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤ 5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤ 300	71 mW	101 mW	132 mW	162 mW	192 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥ 50 mm
≤ 300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

6.2 Exemption Evaluation

Frequency (MHz)	Max Field Strength @ 10m (dB (uV/m))	EIRP dBm	Note
13.56	43.95	-40.82	Field Strength measurements were taken from Report # 104901690MPK-001

The maximum EIRP of -40.82 dBm (0.0001 mW) is less than 71 mW. According to RSS-102 Section 2.5.1, the device is exempt in fixed, mobile, or portable device exposure conditions

6.3 Evaluation Results

The sample evaluated was found to Comply. The maximum conducted power is less than 71 mW.

7 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
1.0	March 01, 2022	104901690MPK-003	GN	KV	Original Issue