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Stress Engineering Services, Inc.
MPE REPORT

SCOPE OF WORK
MPE CALCULATION
ON THE IGROWTH GENERATION 2 KITCHEN DEVICE

REPORT NUMBER
104797984LEX-001b

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MPE TEST REPORT

Report Number: 104797984LEX-001b
Project Number: G104797984

Report Issue Date: 12/27/2021

Product Name: iGrowth Generation 2 Kitchen Device

Standards: FCC Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

RSS-102 Issue 5 RF Field Strength Limits for Devices Used by the General Public

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

Client:
Stress Engineering Services, Inc.
7030 Stress Engineering Way
Mason, OH 45040-7386
USA

Report prepared by

Brian Lackey, Staff Engineer

Report reviewed by

Bryan Taylor, Team Leader

Table of Contents

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
8	FCC Part 1.1310 Limits for Maximum Permissible Exposure (MPE) (Limits for General Population / Uncontrolled Exposure)	Pass
	RSS-102 Issue 5 RF Field Strength Limits (For Devices Used by the General Public)	Pass

3 Client Information

This product was tested at the request of the following:

Client Information	
Client Name:	Stress Engineering Services, Inc.
Address:	7030 Stress Engineering Way Mason, OH 45040-7386 USA
Contact:	Joe Bullard
Telephone:	+1 (513) 336-6701
Email:	Joseph.bullard@stress.com
Manufacturer Information	
Manufacturer Name:	Stress Engineering Services, Inc.
Manufacturer Address:	7030 Stress Engineering Way Mason, OH 45040-7386 USA

4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	iGrowth Generation 2 Kitchen Device
Model Number	3283
Serial Number	PT2.0-P00021
Supported Transmit Bands	RFID: 13.110MHz – 14.010MHz (FCC Part 15.225 / RSS-210 Issue 10)
Test Start Date	10/22/2021
Test End Date	12/1/2021
Device Received Condition	Good
Test Sample Type	Production
Input Rating	7.5VDC

Description of Equipment Under Test (provided by client)
2nd Generation kitchen towel consumption monitoring device for consumer research studies.

4.1 Variant Models:

There were no variant models covered by this evaluation.

5 FCC Limits

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

6 RSS-102 Issue 5 Exposure Limits:

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	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142\ f^{0.3417}$	$0.008335\ f^{0.3417}$	$0.02619\ f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158\ f^{0.5}$	$4.21 \times 10^{-4}\ f^{0.5}$	$6.67 \times 10^{-5}\ f$	$616000/f^{1.2}$

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

7 Test Procedure

An MPE evaluation for was performed in order to show that the device was compliant with the general population exposure limits from FCC §2.1091. The measured maximum field strength was converted to Effective Isotropic Radiated Power (EIRP) using the formula below:

$$EIRP_{mW} = \frac{(E \cdot d)^2}{30} \cdot \frac{1000\ mW}{1\ W}$$

where:

E = electric field strength in V/m
d = distance in m

The 10-g extremity SAR exclusion threshold was calculated per FCC KDB 447498 D01 General RF Exposure Guidance v06 § 4.3.1(c), for devices operating below 100 MHz with separation distance ≤ 50 mm:

$$EIRP_{mW} \leq 7.5 \cdot \frac{50\ mm}{\sqrt{0.1\ GHz}} \cdot \left(1 + \log\left(\frac{100}{13.5\ MHz}\right)\right) \cdot \frac{1}{2}$$

$$EIRP_{mW} \leq 1109\ mw$$

An RF Exposure Evaluation was performed in accordance with RSS-102 Issue 5 § 2.5.2. The limit for the source-based, time-averaged maximum EIRP was 1 W (1000 mW).

8 Results:

The device was found to be exempt from routine SAR evaluation based on FCC and ISED requirements.

FCC MPE Data

Field Strength @ 3m (dBµV/m)	Field Strength @ 3m (V/m)	EIRP (mW)	Limit (mW)	Exempt?
60.56	1.066×10^{-6}	3.41×10^{-4}	1109	Exempt

RSS-102 Issue 5 MPE Data

Field Strength @ 3m (dBµV/m)	Field Strength @ 3m (V/m)	EIRP (mW)	Limit (mW)	Exempt?
60.56	1.066×10^{-6}	3.41×10^{-4}	1000	Exempt

9 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	12/27/2021	104797984LEX-001b	BL	BCT	Original Issue