

FCC Part 1 Subpart I FCC Part 2 Subpart J RSS 102 ISSUE 6

RF EXPOSURE REPORT

FOR

HOUSEHOLD FOOD PREPARING MACHINE

MODEL NUMBER: VM0230, VM0231, VM0232, VM0233, VM0234

FCC ID: 2AJEHVM0230

IC: 21814-VM0230

REPORT NUMBER: R15203365-E2

ISSUE DATE: 2024-08-07

Prepared for VITA-MIX CORPORATION 8615 USHER RD. CLEVELAND, OH 44138, UNITED STATES

Prepared by UL LLC 12 LABORATORY DR. RESEARCH TRIANGLE PARK, NC 27709 USA TEL: (919) 549-1400



Revision History

Rev.	lssue Date	Revisions	Revised By
V1	2024-04-30	Initial Issue	Charles Moody
V2	2024-08-07	Revised to Include RSS-102 and Updated Calculation	Charles Moody

Page 2 of 10

TABLE OF CONTENTS

1.	ATTESTATION OF TEST RESULTS4				
2.	TES	T METHODOLOGY	5		
3.	REF	ERENCES	5		
4.	FAC	ILITIES AND ACCREDITATION	5		
5.	DEC	SISION RULES AND MEASUREMENT UNCERTAINTY	5		
5	.1.	METROLOGICAL TRACEABILITY	5		
5	.2.	DECISION RULES	5		
6.	MAX	(IMUM PERMISSIBLE EXPOSURE (LIMITS AND EQUATIONS)	6		
6	.1.	FCC RULES	6		
6	.2.	ISED RULES	7		
6	.3.	EQUATIONS	8		
7.	RF E	EXPOSURE RESULTS1	0		

1. ATTESTATION OF TEST RESULTS

RSS 102 ISSUE 6

COMPANY NAME:	Vita-Mix Corporation 8615 Usher Rd. Cleveland, OH 44138, United St	ates			
EUT DESCRIPTION: Household Food Preparing Machine					
MODEL:	VM0230, VM0231, VM2032, VM0	0233, VM0234			
SERIAL NUMBER:	SERIAL NUMBER: Non-Serialized				
SAMPLE REVEIVED DATE: 2024-03-26, 2024-04-19					
DATE TESTED:					
APPLICABLE STANDARDS					
STANDARD TEST RESULTS					
FCC PART 1 SUBP	ART I & PART 2 SUBPART J	Complies			

UL LLC. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC. will constitute fraud and shall nullify the document.

Approved & Released For UL LLC By:

Prepared By:

Michel /

Michael Antola Staff Engineer Consumer, Medical and IT Segment UL LLC

Chur Muly

Complies

Charles Moody Electrical Engineer Consumer, Medical and IT Segment UL LLC

Page 4 of 10

FORM NO: 03-EM-F00858 TEL: (919) 549-1400

This report shall not be reproduced except in full, without the written approval of UL LLC.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC Parts 1.1310, 2.1091, 2.1093, KDB 447498 D01 v06, KDB 447498 D03 V01, IEEE Std C95.1-2005, and IEEE Std C95.3-2002, IC Safety Code 6 and RSS 102 Issue 6.

3. REFERENCES

Maximum circuit input power is excerpted from client documentation.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration	
	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	1150067	2180C	005074	
\boxtimes	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	030007	27265	625374	

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. DECISION RULES

For all tests where the applicable $U_{LAB} \le U_{MAX}$ the Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2, where $U_{MAX} = 30\%$ (0.3) for RF Exposure evaluations. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

For all tests where the applicable $U_{LAB} > U_{MAX}$ the Decision Rule is based on Guarded Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.3.2, with a guard band equal to $(U_{LAB} - U_{MAX})$, where $U_{MAX} = 30\%$ (0.3) for RF Exposure evaluations. (Test results are adjusted by the value of the guard band to determine conformity with a specified requirement.)

6. MAXIMUM PERMISSIBLE EXPOSURE (LIMITS AND EQUATIONS)

6.1. FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (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.

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 Exposure									
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					
300-1,500			f/300	6					
1,500-100,000			5	6					
	(B) Limits for Genera	I Population/Uncontrolle	d Exposure	I					
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					
300-1,500			f/1500	30					
1,500-100,000			1.0	30					

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

f = frequency in MHz

* = Plane-wave equivalent power density

Notes:

- (1) Occupational/controlled exposure 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 a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
- (2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

Page 6 of 10

6.2. ISED RULES

For the purpose of this standard, Innovation, Science and Economic Development (ISED) has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6.

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

Frequency RangeElectric Field Magnetic Field Power DentistyReference Period (MHz) (V/m rms) (A/m rms) (W/m²) (minutes) 0.003-1021 83 90 Instantaneous* -6** 0.1-10 0.73/ f 6** 1.1-10 87/ f 0.5 _ 10-20 27.46 0.0728 -2 6 58.07/ f^{0.25} 0.1540/ f^{0.25} 8.944/ f^{0.5} 20-48 6 6 48-300 22.06 0.05852 1.291 300-6000 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 616000/f^{1.2} 150000-300000 0.158 f ^{0.5} 4.21 x 10⁻⁴ f ^{0.5} 6.67 x 10⁻⁵ f

Note: *f* is frequency in MHz.

* Based on nerve stimulation (NS).

** Based on specific absorption rate (SAR).

6.3. EQUATIONS

POWER DENSITY

Power density is given by:

S = EIRP / (4 * Pi * D^2)

Where

S = Power density in mW/cm² EIRP = Equivalent Isotropic Radiated Power in mW D = Separation distance in cm

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

DISTANCE

Distance is given by:

D = SQRT (EIRP / (4 * 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

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

Source-based time-averaged EIRP = (DC / 100) * EIRP

Where

UL LLC

DC = Duty Cycle in %, as applicable EIRP = Equivalent Isotropic Radiated Power in mW

DISTANCE CORRECTION

Distance correction factor to scale E-field reading from x meters to y meters is as follows:

Correction Factor = $20\log(x/y)$

Where x is the initial measurement distance and y is the desired distance.

Page 8 of 10

MAXIMUM E-FIELD STRENGTH (dBuV/m to V/m)

To convert from dBuV/m to V/m, the following equation was used:

V/m = 10^[(dBuv/m -120) / 20].

MIMO AND COLOCATED TRANSMITTERS (IDENTICAL LIMIT FOR ALL TRANSMITTERS)

For multiple chain devices, and colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the EIRP (in linear units) of each transmitter.

Total EIRP = (EIRP1) + (EIRP2) + ... + (EIRPn)

where

EIRPx = Source-based time-averaged EIRP of chain x or transmitter x

The total EIRP is then used to calculate the Power Density or the Distance as applicable.

MIMO AND COLOCATED TRANSMITTERS (NON-IDENTICAL LIMIT FOR ALL TRANSMITTERS)

For multiple colocated transmitters operating simultaneously in frequency bands where different limits apply:

The Power Density at the specified separation distance is calculated for each transmitter chain or transmitter.

The fraction of the exposure limit is calculated for each chain or transmitter as (Power Density of chain or transmitter) / (Limit applicable to that chain or transmitter).

The fractions are summed.

Compliance is established if the sum of the fractions is less than or equal to one.

Page 9 of 10

7. RF EXPOSURE RESULTS

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

Client Provided Data:

1. Maximum Circuit Input Power

(Single chain transmitters, and non-colocated transmitters) =H5/(4*3.14*((C5)^2))

Single Chain and non-colocated transmitters									
Band	Mode	Separ.	Maximum	Maximum	EIRP	FCC PD	ISED PD	FCC	IC
		Distance	Measured E-Field	Measured E-Field				PD Limit	PD Limit
			Strength (30m)	Strength (3m)					
		(cm)	(dBuV/m)	(dBuV/m)	(mW)	(mW/cm^2)	(W/m^2)	(mW/cm^2)	(W/m^2)
13.56 MHz	VM0231	20.00	29.390	69.390	0.0026	0.000	0.000	0.979	2.000
13.56 MHz	VM0232	20.00	26.110	66.110	0.0012	0.000	0.000	0.979	2.000
13.56 MHz	VM0234	20.00	18.710	58.710	0.0002	0.000	0.000	0.979	2.000

Notes:

1. Maximum measured E-Field strength at 3 meters was converted to EIRP and compared to the FCC and ISED PD limits for 13.56MHz radios. The calculated PD for FCC and ISED are significantly below the PD limits.

END OF TEST REPORT

Page 10 of 10