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Report Template Revision Date: 2021-11-03

Report Template Version: V05

RF Exposure Evaluation Report

Report No.: CQASZ20240100124E-02

Applicant: ChicagoTronics, Inc.

Address of Applicant: 8275 S. Eastern Ave, Suite 200-924, Las Vegas, NV 89123-3545

Equipment Under Test (EUT):

EUT Name: NVM001 Vertical Mouse Receiver

Test Model No.: NVM001R
Model No.: NVM001R

Brand Name: N/A

 FCC ID:
 2AHKSNVM001R

 Standards:
 47 CFR Part 1.1307

 47 CFR Part 2.1093

447498 D04 Interim General RF Exposure Guidance v01

Date of Receipt: 2024-1-10

Date of Test: 2024-1-10 to 2024-1-19

Date of Issue: 2024-4-10
Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above

Tested By:

(Lewis Zhou)

Timo Lei)

Approved By:

(Alex Wang)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.



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1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date	
CQASZ20240100124E-01	Rev.01	Initial report	2024-4-10	



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3 General Information

3.1 Client Information

Applicant:	ChicagoTronics, Inc.
Address of Applicant:	8275 S. Eastern Ave, Suite 200-924,Las Vegas, NV 89123-3545
Manufacturer:	ChicagoTronics, Inc.
Address of Manufacturer:	8275 S. Eastern Ave, Suite 200-924,Las Vegas, NV 89123-3545
Factory:	ChicagoTronics, Inc.
Address of Factory:	8275 S. Eastern Ave, Suite 200-924,Las Vegas, NV 89123-3545

3.2 General Description of EUT

<u> </u>					
Product Name:	NVM001 Vertical Mouse Receiver				
Model No.:	NVM001R				
Test Model No	NVM001R				
Trade Mark:	N/A				
EUT Supports Radios application:	: 2403-2480MHz				
Software Version:	ZM6.0				
Hardware Version:	VER2.0				
Sample Type:	☐ Mobile ☐ Portable ☐ Fix Location				
EUT Power Supply:	Power supply computer				

3.3 General Description of 2.4G custom

Operation Frequency:	2403-2480MHz			
Modulation Technique:	Non Frequency Hopping Spread Spectrum(NFHSS)			
Modulation Type:	GFSK			
Number of Channel:	16			
Test Software of EUT:	nRFgo Studio			
Antenna Type:	PCB antenna			
Antenna Gain:	-0.71dBi			



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4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

447498 D04 Interim General RF Exposure Guidance v01

3.2. SAR Test Reduction Guidance

SAR test reduction procedures [Glossary] allow using a particular set of test data as representative of other, similar, test conditions. This may be applied for data within different test positions (e.g. body, head, extremity), wireless modes (e.g. Wi-Fi, cellular), and frequency bands. This test reduction process provides for the use of test data for one specific channel, while referencing to those data for demonstrating compliance in other required channels for each test position of an exposure condition, within the operating mode of a frequency band. This is limited specifically to when the reported 1-g or 10-g SAR for the mid-band or highest output power channel meets any of the following conditions.

4.1.2 Limits

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ /4.

As for devices with antennas of length greater than λ /4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ /2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula (B.2).



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$$P_{\text{th (mW)}} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \le 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \le 40 \text{ cm} \end{cases}$$
(B. 2)

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20}\operatorname{cm}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
y (MHz)	300	39	65	88	110	129	148	166	184	201	217
	450	22	44	67	89	112	135	158	180	203	226
	835	9	25	44	66	90	116	145	175	207	240
Frequency	1900	3	12	26	44	66	92	122	157	195	236
nba	2450	3	10	22	38	59	83	111	143	179	219
Fre	3600	2	8	18	32	49	71	96	125	158	195
	5800	1	6	14	25	40	58	80	106	136	169





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4.1.3 EUT RF Exposure

Measurement Data

$$EIRP = E_{Meas} + 20 \log(d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

 E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m

 d_{Meas} is the measurement distance, in m

Channel	EIRP (dBm)	ERP (dBm)	Maximum tune-up Power (mW)	Exclusion threshold (mW)
Lowest (2403MHz)	-5.53	-7.68	0.17	
Middle (2441MHz)	-6.90	-9.05	0.12	3.0
Highest (2480MHz)	-6.30	-8.45	0.14	

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20240100121E-01.

*** END OF REPORT ***