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RF Exposure Evaluation Report

Report No.: CQASZ20200901064E-02
Applicant: ChicagoTronics, Inc.
Address of Applicant: 1736 W. Pierce Avenue. Chicago, Illinois USA
Equipment Under Test (EUT):
EUT Name: Nano receiver
Model No.: CKM620R
Brand Name: Skilcraft
FCC ID: 2AHKSCKM620R
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-09-17
Date of Test: 2020-09-17 to 2020-10-12
Date of Issue: 2020-10-12
Test Result: PASS*

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

Tested By:

Tiny You

(Tiny You)

Reviewed By:

Sheek Luo

(Sheek Luo)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200901064E-02	Rev.01	Initial report	2020-10-12

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3 General Information

3.1 Client Information

Applicant:	ChicagoTronics, Inc.
Address of Applicant:	1736 W. Pierce Avenue. Chicago, Illinois USA
Manufacturer:	Dongguan Lingjie Electronics & Technology Co., Ltd
Address of Manufacturer:	No.16 Zhenxing North Road, Xiegang, Dongguan, China.
Factory:	Dongguan Lingjie Electronics & Technology Co., Ltd
Address of Factory:	No.16 Zhenxing North Road, Xiegang, Dongguan, China.

3.2 General Description of EUT

Product Name:	Nano receiver
Model No.:	CKM620R
Trade Mark:	Skilcraft
Hardware Version:	V 2.0
Software Version:	V 7.0
Frequency Range:	2403.85M-2479.85MHz
Modulation Type:	GFSK
Number of Channels:	16 (declared by the client)
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-0.71dBi
Power Supply:	DC 5V

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{[\sqrt{f(\text{GHz})}]} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where} \right.$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.2 EUT RF Exposure Evaluation

1) For 2.4G

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

p_t = transmitter output power in watts,

g_t = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, $10^{((dB\mu V/m)/20)/10^6}$,

d = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20200901064E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
2403.85	89.11	Peak
2403.85	86.81	Average

For 2402MHz wireless:

Field strength = 89.11dB μ V/m @3m

Ant. gain -0.71dBi; so Ant numeric gain=0.85

$$\text{So } p_t = \{ [10^{(89.11/20)/10^6} \times 3]^2 / 30 / 0.85 \} \times 1000 \text{mW} = 0.29 \text{mW}$$

$$\text{So } (0.29 \text{mW} / 5 \text{mm}) \times \sqrt{2.403.85 \text{GHz}} = 0.09$$

$$0.09 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.