



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-TRF-03 Rev 1.1

Report No.: GZCR240400033904

Page: 1 of 11

FCC ID: U9K-CA0100

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2404000339AT
Applicant: SimpliSafe, Inc.
Address of Applicant: 100 Summer St, Suite 300 Boston MA 02110 USA
Manufacturer: SimpliSafe, Inc.
Address of Manufacturer: 100 Summer St, Suite 300 Boston MA 02110 USA
Factory: Jetta (China) Industries Co., Ltd.
Address of Factory: 333 Cai Xin Lu, Lan He Zhen, Nan Sha Qu, Guangzhou City, Guangdong Province, China
Product Name: Smart Lock
Model No.: CA010-01DUS, CA010-01RUS, CA010-02DUS, CA010-02RUS ♣
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Trade Mark: SimpliSafe
Standard(s) : 47 CFR Part 2.1093
Date of Receipt: 2024-04-11
Date of Evaluation: 2024-04-15 to 2024-04-18
Date of Issue: 2024-05-10

Evaluation Result:

Pass*

* In the configuration evaluated, the EUT complied with the standards specified above.

Ricky Liu

Ricky Liu
Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch, Inspection & Testing Services

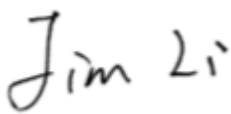
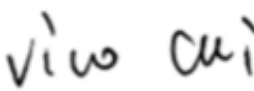
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Revision Record			
Version	Report No.	Date	Remark
01	GZCR240400033904	2024-05-10	Original

Authorized for issue by:			
			
		<div>Jim Li/Project Engineer</div>	
			
		<div>Vico Cui/Reviewer</div>	

2 Evaluation Summary

Item	Standard	Method	Requirement	Result
RF Exposure	47 CFR Part 2.1093	47 CFR Part 2.1093	47 CFR Part 2.1093	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

♣ Declaration of EUT Family Grouping:

Model No.: CA010-01DUS, CA010-01RUS, CA010-02DUS, CA010-02RUS

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with the difference are as below table shown:

Models	Main test model	Difference
CA010-01RUS	CA010-01DUS	Packing
CA010-02DUS		Color, Packing
CA010-02RUS		Color, Packing

Therefore, only one model CA010-01DUS was tested in this report.

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 6 V
	Test Voltage: DC 6 V
Cable(s):	None
Antenna Number:	2 (one for BLE and the other for 433.92 MHz)
For BLE	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.2 LE
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	Integral Antenna
Antenna Gain:	2 dBi according to antenna specification
For 433.92 MHz	
Center Operation Frequency	433.92 MHz
Channel Numbers:	1
Modulation Type:	FSK
Antenna Gain:	-5.7 dBi according to antenna specification
Antenna Type:	Integral Antenna
FW Version	lock_mfg_package-1.4.12-dev.1_21.36.1.7ef2bc3-1.0.1.39-6235c2a0
	FW Default: Decimal 0
Radio Power	CLI Modification: Decimal -7
Frequency Deviation	13 kHz
Data Rate	4.8 kbps
Device's Maximum Packet Type	Base Station Sync
Device's Maximum Packet Length (bytes) / (ms)	32 bytes/103ms
HW PN:Revision	PCA-10357-00:A
Serial Number	010BF9E0

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,
Guangdong, China 510663
Tel: +86 20 82155555

No tests were sub-contracted.

4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None



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5 Technical Requirements Specification

5.1 RF Exposure Evaluation

5.1.1 Limit & Test Method

1, Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

2, MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table B.1—Thresholds For Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	—	1.34	159 m	—	35.6 m	1,920 R ²
1.34	—	30	35.6 m	—	1.6 m	3,450 R ² /f ²
30	—	300	1.6 m	—	159 mm	3.83 R ²
300	—	1,500	159 mm	—	31.8 mm	0.0128 R ² f
1,500	—	100,000	31.8 mm	—	0.5 mm	19.2R ²

Subscripts L and H are low and high; λ is wavelength.
From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in

the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than $ERP_{20\text{cm}}$ in Formula (B.1) [repeated from §2.1091(c)(1); also in §1.1307(b)(1)(i)(B)].

$$P_{\text{th}} (\text{mW}) = ERP_{20\text{ cm}} (\text{mW}) = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only 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.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

Limit calculation			
Frequency range	Frequency(MHz)	$R(\lambda/2\pi)(\text{m})$	Threshold ERP(W)
300~1500MHz	433.92	0.1101	0.067
1500~100000MHz	2402	0.0199	0.008

3, SAR-based Exemption

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 $\lambda/4$.

As for devices with antennas of length greater than $\lambda/4$ where the gain is not well defined, but always less than that of a half-wave dipole (length $\lambda/2$), 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 P_{th} (mW).



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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). P_{th} is given by Formula (B.2).

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

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance(mm)									
	5	10	15	20	25	30	35	40	45	50
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
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Limit calculation				
Frequency range(GHz)	Frequency(GHz)	X	Distance(cm)	Pth (mW)
0.3~1.5	0.43392	0.988	0.5	23.166
1.5~6	2.48	1.905	0.5	2.717

5.1.2 Conclusion

For 433.92 MHz

1, Maximum transmit power

The Power Data is based on the RF Test Report

GZCR240400033903.

Test Mode	Test Channel[MHz]	Power[dBuV/m]	Test distance[m]
ASK	433.92	73.5	3

2, RF Exposure Calculation

The max Radiated Power is 73.5 dBuV/m@ 3 m.

According to the formula, calculate the P test result:

$E(dBuV/m)@0.005m = E(dBuV/m)@3m + 20 \cdot \log[E(dBuV/m)@0.005m / 3 / 0.005] = 129.06 (dBuV/m)@3m$

$E(V/m)@0.005m = 10^{[E(dBuV/m)@0.005m / 20]} \cdot 10^{-6} = 2.8389 (V/m)@0.005m$

$P = (E \cdot d)^2 / 30 = 0.0067 mW$

	Evaluation method	Exempt Limit(mW)	Verdict
<input checked="" type="checkbox"/>	Blanket 1 mW Blanket Exemption	1mW	Yes
<input type="checkbox"/>	MPE-based Exemption(ERP)	7mW(ERP)	--
<input type="checkbox"/>	SAR-based Exemption(P_{th})	23.166mW	--

For BLE, the EIRP is 2.47 dBm (1.77mW) according to test report GZCR240400033902, so the ERP=2.47-2.15=0.32 dBm (1.07mW)

	Evaluation method	Exempt Limit(mW)	Verdict
<input type="checkbox"/>	Blanket 1 mW Blanket Exemption	1mW	--
<input type="checkbox"/>	MPE-based Exemption(ERP)	7mW(ERP)	--
<input checked="" type="checkbox"/>	SAR-based Exemption(P_{th})	2.717mW	Yes

The 433.92 MHz and BLE can be transmitted at the same time, so $0.0067/1 + 1.07/2.717 = 0.4 < 1$.

So, the SAR report is not required.



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6 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2404000339AT

- End of the Report -



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