

COMPLIANCE WORLDWIDE INC. TEST REPORT 268-22RF

In Accordance with the Requirements of
Federal Communications Commission CFR Title 47 Part 2.1093
Radio Frequency Exposure Evaluation
Innovation, Science and Economic Development Canada
RSS-102, Issue 5 + Amendment 1:2021
Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus

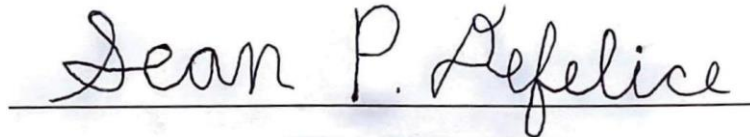
Issued to
SimpliSafe Inc
294 Washington Street, 9th Floor
Boston, MA 02108

for the
Keypad
Model: SSKP3
433.92 MHz

FCC ID: U9K-KP3000
IC: 20992-KP3000

Report Issued on August 5, 2022

Tested by



Sean P. Defelice

Reviewed by



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1. Scope

This test report certifies that the Simplisafe, Inc, Keypad SSKP3 433.92 MHz Transmitter, as tested, meets the the FCC Part 2.1093 requirements and the ISED RSS-102, Issue 5 Section 2.5.1 requirements exempting the device from a SAR Evaluation.

The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

- 2.1. Manufacturer:** SimpliSafe
- 2.2. Model Number:** SSKP3
- 2.3 Serial Number:** 0244CAFB
- 2.4 Description of EUT:** Engineered to be wireless. Arm and disarm your system in one click. If an intruder smashes the Keypad, the system still sends a signal to our monitoring center—so we can dispatch police faster.
- 2.5 Power Source:** Batteries 6 VDC, 4 x 1.5V AA Batteries
- 2.6 Hardware Revision:** Revision F
- 2.7 Software/Firmware Revision:** 2.9.6
- 2.8. Modulation Type:** Frequency Shift Keying (2FSK)
- 2.9. Operating Frequency:** 433.92 MHz
- 2.10. EMC Modifications:** None

3. Product Configuration

3.1. Operational Characteristics & Software

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Volts	Freq (Hz)	Description/Function
SimpliSafe	SSKP3	0244CAFB	6.5	VDC	Base Station

3.3. Support Equipment

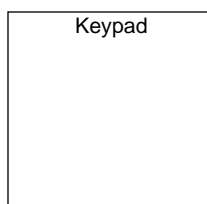
Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
None					

3. Product Configuration (continued)

3.4. Equipment Cables

Cable Type	Length	Shield	From	To
None				

3.5. Block Diagram



4. Measurements Parameters

4.1. Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz ¹	Rohde & Schwarz	ESR7	101156	10/26/2023	2 Years
EMI Test Receiver, 10 Hz - 7GHz ¹	Rohde & Schwarz	ESR7	101770	7/23/2023	2 Years
Spectrum Analyzer, 2 Hz to 26.5 GHz ²	Rohde & Schwarz	FSW26	102057	6/24/2023	2 Years
Spectrum Analyzer, 9 kHz to 40 GHz ³	Rohde & Schwarz	FSV40	100899	8/12/2022	2 Years
Spectrum Analyzer 10 Hz – 40 GHz ⁴	Rohde & Schwarz	FSVR40	100909	9/18/2022	2 Years
Biconilog Antenna, 30 MHz - 2 GHz	Sunol Sciences	JB1	A050913	7/1/2023	2 Years
Digital Barometer	Control Company	4195	ID236	1/27/2024	2 Years

¹ ESR7 Firmware revision: V3.48 SP3, Date installed: 09/30/2020

Previous V3.48 SP2, installed 07/23/2020.

² FSW26 Firmware revision: V4.71 SP1, Date installed: 11/16/2020

Previous V4.61, installed 08/11/2020.

³ FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016

Previous V2.30 SP1, installed 10/22/2014.

⁴ FSVR40 Firmware revision: V2.23 SP1, Date installed: 08/19/2016

Previous V2.23, installed 10/22/2014.

4. Measurements Parameters (continued)

4.2. Software Used to Perform Test

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	Used to process conducted emissions data

4.3 Measurement & Equipment Setup

Test Dates:	8/2/2022, 8/3/2022
Test Engineer:	Sean Defelice
Site Temperature (°C):	19.5
Relative Humidity (%RH):	32
Frequency Range:	30 kHz to 5 GHz
Measurement Distance:	3 Meters and 1 Meter
EMI Receiver IF Bandwidth:	200 Hz (30 kHz – 150 kHz) 9 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1 GHz) 1 MHz (>1 GHz)
EMI Receiver Avg Bandwidth:	≥ 3 * RBW or IF(BW)
Detector Functions:	Peak, Quasi-Peak and Average

4.4 Test Procedure

Test measurements were made in accordance FCC Part 15.231: Periodic operation within the bands 40.66 – 40.70 MHz and above 70 MHz using ANSI C63.10: 2013, American National Standard for Methods for Unlicensed Wireless Devices.

In addition, FCC KDB 447498 D01 General RF Exposure Guidance v06, October 23, 2015 are referenced for the testing and requirements detailed in this report.

Testing was performed in accordance with the requirements detailed in ISED RSS-210, Annex II using ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and ISED RSS-GEN, Issue 5 Amendment 1 (March 2019) and Amendment 2 (February 2021).

In addition, ISED RSS-102, Issue 5, Amendment 1 (February 2, 2021) are referenced for the testing and requirements detailed in this report.

5. Choice of Equipment for Test Suits

5.1. Choice of Model

This test report is based on the test samples supplied by the manufacturer and are reported by the manufacturer to be equivalent to the production units.

5.2. Presentation

The test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for the product equipment configuration.

5.3. Choice of Operating Frequencies

The transmitter in the unit under test utilizes a single operating frequency at approximately 433.92 MHz

Test Mode Mode 1: Transmit mode
Description: Automatic FSK message every 2 seconds
Radio PA Setting: -4.5 dB
Data Rate: 4.8kbps
Frequency Deviation: 26 kHz
Modulation: 2FSK
Maximum Packet Length (ms): 137.6

Mode 2: Normal mode
Description: Representative of Production FW
Radio PA Setting: -4.5 dB
Data Rate: 4.8kbps
Frequency Deviation: 26 kHz
Modulation: 2FSK
Typical Packet Length (ms): 55ms

6. Measurement Data (continued)

6.1. Radiated Field Strength of Fundamental (15.231, Section (b), RSS-210 A1.1.2(a))

Requirement: The 3 meter field strength of the fundamental emissions from intentional radiators operating within the 260-470 MHz frequency bands shall comply with the limits specified in FCC Part 15.231, Section (b). The limit is based on a linear interpolation of the following field strength:

Fundamental Frequency (MHz)	Field Strength of Fundamental ($\mu\text{V/m}$)
260–470	3,750 to 12,500 $\mu\text{V/m}$

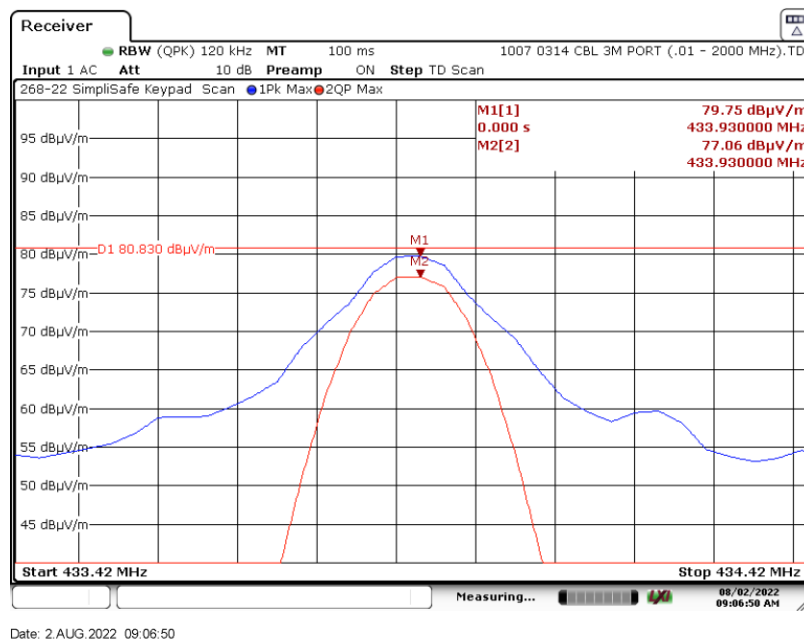
Fundamental Limit at 433.93 MHz = 10,997 $\mu\text{V/m}$ = 80.83 dB $\mu\text{V/m}$

Test Note: A Quasi Peak Detector was used to compare against the average limits due to the longest duration of a digital transmission.

Conclusion: Compliant - The radiated field strength of the device under test complies with the requirements detailed in FCC Part 15.231, Section (b) and RSS-210 A1.1.2(a).

6.1.1. Worst Case Radiated Field Strength of Fundamental

Frequency (MHz)	Amplitude ¹ (dB $\mu\text{V/m}$)		Limit (dB $\mu\text{V/m}$)		Margin (dB)		Ant Polarity	Ant Height	Turntable Azimuth	Result
	Peak	Avg	Peak	Avg	Peak	Avg	H/V	cm	Deg	
433.93	79.75	77.06	100.83	80.83	-21.08	-3.77	V	133	300	Compliant



6. Measurement Data (continued)

6.2. Public Exposure to Radio Frequency Energy Levels (FCC Part 2.1093)

6.2.1. 2.1093 Requirements

Requirement: Portable devices are subject to radio frequency radiation exposure requirements. For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

For a 1-g SAR, the test exclusion result must be ≤ 3.0 .

Test Notes: 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 the following formula:

$$\text{SAR Test Exclusion} = \frac{P_{\text{MAX}}}{d_{\text{MIN}}} \times \sqrt{f_{(\text{GHz})}} \quad (1)$$

P_{MAX} mW Maximum power of channel, including tune-up tolerance
 d_{MIN} mm Minimum test separation distance, mm (≤ 50 mm)
 $f_{(\text{GHz})}$ GHz $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz (>100 MHz and <6 GHz)

The following equation is used to determine the peak output (P_{MAX}) power from the measured field strength:

$$P = \frac{(E \times d)^2}{(30 \times G)}$$

P = the power in Watts. 0.00002249
 E = the measured maximum field in V/m 0.00971628
 G = the numeric gain of the transmitting antenna over an isotropic radiator. 1.26
 d = the distance in meters of the field strength measurement. 3.00

Input: P_{MAX}^1 (mW) 0.022
 d_{MIN} (mm) 5.000
 $f_{(\text{GHz})}$ 0.434
Test Exclusion: 0.0030
Limit Exemption: 3.0000

Conclusion: Compliant - The device under test meets the exclusion requirement detailed in FCC OET 447498, dated October 23, 2015 Clause 4.3.1 (a).

6. Measurement Data (continued)

6.3. Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (RSS-102, Issue 5 + A1:2021)

6.3.1. RSS-102 Issue 5 Requirements

Requirement: Requirement: SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

All transmitters are exempt from routine SAR and RF exposure evaluations provided that they comply with the requirements of sections 2.5.1

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power.

For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)
	At a Separation distance of ≤ 5 mm
≤ 300	71
450	52

Test Notes: The limit was calculated using a linear interpolation between the two frequency points from Table 1 of RSS-102 Issue 5.

Frequency	Separation Distance	Maximum Power	RSS-102 Limit	Result
(MHz)	(mm)	(mW)	(mW)	
433.92	≤5	0.0225	54.04	Compliant