Signal Communications Corp.

Human RF Exposure Report

SCOPE OF WORK
Human RF Exposure Evaluation – 72-76 MHz Emergency Call Box

REPORT NUMBER
104936117BOX-001d.2

ISSUE DATE
April 6, 2022

[REVISED DATE]
July 11, 2022

DOCUMENT CONTROL NUMBER
Non-Specific Radio Report Shell Rev. December 2017

Human RF Exposure Report

(FULL COMPLIANCE)

Report Number: 104936117BOX-001d.2
Project Number: G104936117

Report Issue Date: April 6, 2022
Report Revision Date: July 11, 2022

Model(s) Tested:	72-76 MHz Emergency Call Box
Model(s) Partially Tested:	None
Model(s) Not Tested but declared equivalent by the client:	None

Standards: The FCC §1.1310: 03/2022 The criteria listed in table 1 was used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b): 03/2022, except in the case of portable devices shall be evaluated according to the provisions of §2.1093 of this chapter.

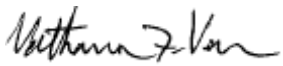
Tested by:
Intertek
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
Signal Communications Corp.
4 Wheeling Avenue
P.O Box 2588
Woburn, MA 01801
USA

Report prepared by

Kouma Sinn / EMC Engineering Supervisor

Report reviewed by



Vathana Ven / EMC Engineering Supervisor

Table of Contents

1 Introduction and Conclusion

This evaluation report covers for a medical implant device subject to routine environmental evaluation for RF exposure.

The evaluation indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining sections are the verbatim text from the actual evaluation during the investigation. These sections include the evaluation name, the specified Method, and Results. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product evaluated **complies** with the requirements of the standard(s) indicated. The results obtained in this report pertain only to the item(s) evaluated. Intertek does not make any claims of compliance for samples or variants which were not evaluated.

2 Evaluation Summary

Section	Test full name	Result
3	Client Information	-
4	Description of Equipment Under Evaluation and Variant Models	-
5	Human RF Exposure FCC §1.1310: 03/2022, §1.1307(b): 03/2022	Compliant
6	Revision History	-

3 Client Information

This EUT was tested at the request of:

Client: Signal Communications Corp.
4 Wheeling Avenue
P.O Box 2588
Woburn, MA 01801
USA

Contact: Nadim Farhat
Telephone: 781-569-0820
Fax: None
Email: nfarhat@sigcom.com

4 Description of Equipment Under Test and Variant Models

The equipment under test is an Emergency Call Box.

Variant Models:

The following variant models have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 Human RF Exposure

5.1 Results:

Limit for Maximum Permissible Exposure (MPE)

FCC Human RF Exposure Limits:

The FCC §1.1310 The criteria listed in table 1 was used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices shall be evaluated according to the provisions of §2.1093 of this chapter.

Part §1.1310 Limits for Maximum Permissible Exposure (MPE)

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 General Population/Uncontrolled Exposure				
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

f = frequency in MHz * = Plane-wave equivalent power density

(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. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of *transient* persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. Such training is not required for *transient* persons, but they must receive written and/or verbal information and notification (for example, using signs) concerning their exposure potential and appropriate means available to mitigate their exposure. The phrase *exercise control* means that an exposed person is allowed to and knows how to reduce or avoid exposure by administrative or engineering controls and work practices, such as use of personal protective equipment or time averaging of 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.

Test Procedure

RF exposure for licensed transmitter is handled at the time of licensing, however, an MPE calculation was performed in order to show the distance at which the device is compliant with the limits of §1.1310. The Antenna gain of 0 dBi was provided by the client. Intertek takes no responsibility for the accuracy of the value. The highest measured conducted output power of 30.0 dBm from Intertek report number # 104936117BOX-001c was used to calculate the minimum safe distance.

FCC Limit For General Population/Uncontrolled Exposure at 75.7 MHz = 0.2 mW/cm^2

Power Density = [EIRP] / [4π x $(D_{cm})^2$]

Where EIRP is in milliwatts and D is in centimeters. Setting the power density equal to the limit of 0.2 mW/cm^2 and solving for D_{cm} yields the following results.

Results:
FCC Part 90.241(a)(2) of the FCC rules specifies that the antenna gain shall not exceed zero dBd which equivalent to 2.15 dBi. Therefore, 2.15 dBi was used for calculation below.

The maximum conducted output power is 30.0 dBm at 75.7 MHz
EUT EIRP = Conducted power + Array Gain + Antenna gain in dBi
EIRP = 30.0 dBm + 2.15 dBi
EIRP = 32.15 dBm or 1640.59 mW

Power Density Limit = [EIRP] / [4π x $(D_{cm})^2$]
0.2 mW/cm^2 = [EIRP] / [4π x $(D_{cm})^2$]
D_{cm} = ([EIRP] / [4π x 0.2])$^{1/2}$

Therefore, the minimum safe distance D_{cm} is D_{cm} = ([1640.59] / [4π x 0.2])$^{1/2}$
D_{cm} = 25.55 cm

6 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	04/06/2022	104936117BOX-001d	KPS	VFV	Original Issue
1	06/30/2022	104936117BOX-001d.1	KPS	VFV	Original Issue
2	07/11/2022	104936117BOX-001d.2	KPS	VFV	Changed MPE to (B) Limits For General Population / Uncontrolled Exposure With Power Density Limit of 0.2 mW/cm^2 to calculate minimum safe distance