

Radio Frequency Exposure Evaluation Report

For:
Koko Home, Inc.

Brand:
Cairns Health

Marketing Name:
Luna

Model Name:
Cairns01

Product Description:

Luna is a radar based contactless device intended to measure heart rate, respiration rate, and sleep stages in adult users at rest during sleep in their home.

FCC ID: Contains (cell) RI7LE910C1SNX (WiFi/BT) T7V9028
IC: Contains (cell) 5131A-LE910C1SNX (WiFi/BT) 216Q-9028

Applied Rules and Standards:

CFR Part1 (1.1307 & 1.1310), Part 2 (2.1091 & 2.1093),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISED RSS-102 Issue 6

REPORT #: EMC_CAIRN_001_25001_RF_Exposure_Rev1

DATE: 2026-05-28



IC recognized #
3462B

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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091 & 2.1093) and ISED standard RSS-102 issue 6 under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant).

In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC and ISED rule parts based on available specifications for worst-case conditions at 20 cm distance to the body.

Company	Description	Model #
Koko Home, Inc.	Luna is a radar based contactless device intended to measure heart rate, respiration rate, and sleep stages in adult users at rest during sleep in their home.	Cairns01

Responsible for testing Laboratory:

2026-05-28	Compliance	Art Thammanavarat (Lead Engineer)	Art Thammanavarat at	Digitally signed by: Art Thammanavarat DN: CN = Art Thammanavarat email = art.thammanavarat@cetecom.com C = AD Date: 2026.05.29 12:03:11 -07'00'
Date	Section	Name	Signature	

Responsible for the Report:

2026-05-28	Compliance	Guangcheng Huang (Senior EMC Test Engineer)	Guangcheng Huang	Digitally signed by: Guangcheng Huang DN: CN = Guangcheng Huang, email = guangcheng.huang@cetecom.com C = US D = cetecom OU = EMC Date: 2026.05.28 22:31:45 -07'00'
Date	Section	Name	Signature	

The test results of this test report relate exclusively to the test item specified in Section3.

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2 **Administrative Data**

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing
City/Zip Code	Milpitas, 95035 CA
Country	USA
Telephone:	+ 1 (408) 586 6200
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EMC Lab Manager:	David Bare
Project Manager:	Ruby Hall

2.2 Identification of the Client

Client's Name:	Koko Home, Inc.
Street Address:	11811 San Vicente Blvd
City/Zip Code	Los Angeles, 90049
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	same as client
Manufacturers Address:	same as client
City/Zip Code	same as client
Country	same as client

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	Cairns01
Marketing Name:	Luna
HW Version:	A
SW Version:	0.27.15-37199
FCC ID:	Contains (cell) RI7LE910C1SNX (WiFi/BT) T7V9028
IC:	Contains (cell) 5131A-LE910C1SNX (WiFi/BT) 216Q-9028
FWIN:	0
HVIN:	0
PMN:	0
Product Description:	Luna is a radar based contactless device intended to measure heart rate, respiration rate, and sleep stages in adult users at rest during sleep in their home.
Power Supply / Rated operating Voltage Range:	TT Electronics: PEAMW12NA-12-B1, Input: 90-264 VAC, 47-63Hz, <0.6A, 115VAC -230VAC Output:12VDC, 1A
Operating Temperature Range	0C to 40C
Sample Revision	Pre-production
EUT Dimensions	Height 20.5 cm; Diameter 12.5 cm (cylindrical enclosure).
Note: All information provided by the client.	

3.2 Radio Specifications

Embedded Radio Technologies	• LTE: Telit LE910C1-SNX (Cat-1) • Wi-Fi/BLE: Panasonic ENW-F9408A1EF (802.11a/b/g/n/ac + Bluetooth 5) (Wi-Fi 5 GHz and BT Classic disabled) • 60 GHz Radar: Texas Instruments IWR6843ARQGALPR (mmWave FMCW radar SoC)
Frequency Range / number of channels:	LTE (LE910C1-SNX): FDD bands B2/B4/B5/B12/B13/B66 (per NA variant). • B2: UL 1850–1910 MHz / DL 1930–1990 MHz • B4: UL 1710–1755 MHz / DL 2110–2155 MHz • B5: UL 824–849 MHz / DL 869–894 MHz • B12: UL 699–716 MHz / DL 729–746 MHz (supported but not used) • B13: UL 777–787 MHz / DL 746–756 MHz • B66: UL 1710–1780 MHz / DL 2110–2200 MHz Wi-Fi (ENW-F9408A1EF): 2.4 GHz 2412–2462 MHz (11 ch US); 5 GHz 5150–5825 MHz (UNII bands; channel availability per regulatory/firmware). Bluetooth BR/EDR/LE: 2402–2480 MHz (79 ch @1 MHz for BR/EDR; 40 ch @2 MHz for BLE). 60 GHz Radar (IWR6843): 60–64 GHz operating band (FMCW radar operation; channelization N/A).
Antenna Information as declared	internal antennas Wifi/BLE: Max gain: 2.1 dBi (2.4 GHz), 1.5 dBi (5 GHz). Radar: ~5.2 dBi around 60 GHz. LTE: B13 (1.33), B5 (2.28), B2/4/66 (6.22)
Note: All information provided by the client.	

4 RF Exposure Limits and FCC and ISED Basic Rules

4.1 FCC Rule Part

4.1.1 Single RF source

§ 2.1091(c)(1) mobile device (to human body >20 cm)

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for mobile devices with single RF sources having either more than an available maximum time-averaged power of 1 mW or more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), whichever is greater.

TABLE 1 TO § 1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1.920 R^2$.
1.34-30	$3.450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

For mobile devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 of this chapter is necessary if the ERP of the device is greater than $ERP_{20\text{cm}}$ in the formula below. If the ERP of a single RF source at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP) in comparison with the following formula 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 (1.64 linear value).

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

§ 2.1093(c)(1) portable device (to human body <20 cm)

The following formula shall only be used in conjunction with portable devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 0.5 centimeters to 20 centimeters and frequencies from 0.3 GHz to 6 GHz

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

4.1.2 Multiple RF sources

§ 1.1307(b)(3)(ii)(A)

Exempt, if the available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

§ 1.1307(b)(3)(ii)(B)

Exempt, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

4.2 IC Rule Part

4.2.1 Exemption limits for routine evaluation on SAR, RSS-102 i6, cl.6.3

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

4.2.2 Exemption limits for routine evaluation on field reference level exposure according to RSS-102 i6, cl.6.6

Frequency [MHz]	Time-averaged EIRP [W]
Below 20	1
20-48	$4.49/f^{0.5}$
48-300	0.6
300-6000	$1.31 \cdot 10^{-2} \cdot f^{0.6834}$
Above 6000	5

5 Evaluations

Analysis of RF Exposure for simultaneous transmission

- Radiation source to human body distance: min. 20 cm (refer applicant provided document “IFU - Device Regulatory Content (manual statements).docx”)
- Evaluations are based on ERP/EIRP calculated from
 - o given antenna gain (provided by applicant) and
 - o conducted output power (provided by module test report of the embedded modules),
 - o except for radar EIRP is measured
- RF related information provided by applicant: co-transmission:
 - o Radar + WIFI 2.4G
 - o LTE + BLE
 - o LTE + WIFI 2.4G + Radar
- Thus, worst case of multiple radiation sources that transmit simultaneously:
 - o LTE + Radar + WIFI 2.4G

5.1 FCC Exemption

Individual radio (for info only)

Radio	F Low [MHz]	Output Power [dBm]	Output Power [mW]	AG [dBi]	AG_i linear	ERP [mW]	ERP Threshold [mW]	Exemption option	Limit ratio (%)
LTE B2	1855	24.00	251	6.22	4.19	641.21	3060	§1.1307(b)(3)(i)(B)	20.95%
LTE B5	829	24.00	251	2.28	1.69	258.82	1691.16	§1.1307(b)(3)(i)(B)	15.3%
LTE B13	782	24.00	251	1.33	1.36	207.97	1595.28	§1.1307(b)(3)(i)(B)	15.7%
LTE B66/4	1715	24.00	251	6.22	4.19	641.21	3060	§1.1307(b)(3)(i)(B)	21%
Radar	60000	12.86	19.3	0	1	11.78	768	§1.1307(b)(3)(i)(C)	1.53%
BLE	2440	3.01	2	2.10	1.62	1.98	3060	§1.1307(b)(3)(i)(B)	0.1%
WiFi 2.4G	2462	24.67	293.1	2.10	1.62	289.73	3060	§1.1307(b)(3)(i)(B)	9.58%

Multiple radios evaluation

Radio	F Low [MHz]	Output Power [dBm]	Output Power [mW]	AG [dBi]	AG_i linear	ERP [mW]	ERP Threshold [mW]	Exemption option	Limit ratio (%)
LTE B2	1855	24.00	251	6.22	4.19	641.21	3060	-	20.95%
Radar	60000	7.66	5.8	5.2	3.31	11.78	768	-	1.53%
WiFi 2.4G	2462	24.67	293.1	2.10	1.62	289.73	3060	-	9.58%
Sum	-	-	-	-	-	-	-	§1.1307(b)(3)(ii)(B)	32.07%

Note:

1. Antenna gain provided by applicant
2. Choose the maximum power to do MPE analysis.

Conclusion:

The worst-case simultaneous transmission sums up to 33.05% and is within the exemption limit of 100%. The EUT is exempt from RF exposure evaluation.

5.2 IC Exemption

Individual radio (for info only)

Radio	F Low [MHz]	Output Power [dBm]	Output Power [mW]	AG [dBi]	AG_i linear	EIRP [W]	EIRP Limit [W]	Exemption option	Limit ratio (%)
LTE B2	1855	24.00	251	6.22	4.19	1.052	2.24	cl.6.6	46.9%
LTE B5	829	24.00	251	2.28	1.69	0.425	1.29	cl.6.6	32.8%
LTE B13	782	24.00	251	1.33	1.36	0.341	1.24	cl.6.6	27.4%
LTE B66/4	1715	24.00	251	6.22	4.19	1.052	2.13	cl.6.6	49.5%
Radar	60000	12.86	19.3	0	1	0.019	5	cl.6.6	0.4%
BLE	2440	3.01	2	2.10	1.62	0.003	2.71	cl.6.6	0.1%
WiFi 2.4G	2462	24.67	293.1	2.10	1.62	0.475	2.72	cl.6.6	17.5%

Multiple radios evaluation

Radio	F Low [MHz]	Output Power [dBm]	Output Power [mW]	AG [dBi]	AG_i linear	EIRP [W]	EIRP Limit [W]	Exemption option	Limit ratio (%)
LTE B66/4	1715	24.00	251	6.22	4.19	1.052	2.13	-	49.5%
Radar	60000	12.86	19.3	0	1	0.019	5	-	0.4%
WiFi 2.4G	2462	24.67	293.1	2.10	1.62	0.475	2.72	-	17.5%
Sum	-	-	-	-	-	-	-	cl.6.6	67.3%

Note:

1. Antenna gain provided by applicant
2. Choose the maximum power to do MPE analysis.

Conclusion:

The worst-case simultaneous transmission sums up to 67.3% and is within the exemption limit of 100%. The EUT is exempt from RF exposure evaluation.

6 Revision History

Date	Report name	Changes to report	Prepared by
2026-04-24	EMC_CAIRN_001_25001_RF_Exposure	Initial version	Guangcheng Huang
2026-05-28	EMC_CAIRN_001_25001_RF_Exposure_Rev1	Cover page, update brand name, Sec.3.2, note WIFI5GHz and BT classic disabled, Sec.5.1/5.2, update radar evaluation by using known value	Guangcheng Huang

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