

FCC SAR Exclusion Report

Report No. : SFBEIH-WTW-P22050972

Applicant : Sercomm Corporation

Address : 8F, No. 3-1, YuanQu St., NanKang, Taipei, 115, Taiwan, R.O.C.

Product Name : Airfinder Rechargeable SuperTag

Brand : AirFinder, Sercomm (refer to section 2 for more details)

FCC ID : P27SMRTK02

Model No. : LL-AF2-ST-SM-RTK02, SM-RTK02 (refer to section 2 for more details)

FCC Rule Part : CFR §2.1093

Standards : IEEE C95.1:1992, IEC/IEEE 66209-1528:2020,
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 941225 D05 v02r05
KDB 447498 D04 Interim General RF Exposure Guidance v01

Sample Received Date : Jul. 11, 2022

Date of Evaluation : Jul. 19, 2022

Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location : No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City, Taiwan

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Reason for Change	Date Issued
SFBEIH-WTW-P22050972	Initial release	Jul. 20, 2022

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1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR _{1g} (W/kg)
PCB	LTE 2	Not Required
	LTE 4	Not Required
	LTE 12	Not Required
	LTE 13	Not Required

Note:

1. The SAR criteria (**Head & Body: SAR-1g1.6 W/kg**) for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

References Guidance: IEEE C95.1:1992, FCC-19-126

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2. Description of Equipment Under Test

EUT Type	Airfinder Rechargeable SuperTag
Brand Name	AirFinder, Sercomm(refer to note for more details)
FCC ID	P27SMRTK02
Model Name	LL-AF2-ST-SM-RTK02, SM-RTK02 (refer to note for more details)
Tx Frequency Bands (Unit: MHz)	LTE Band 2 : 1850 ~ 1910 LTE Band 4 : 1710 ~ 1755 LTE Band 12 : 699 ~ 716 LTE Band 13 : 777 ~ 787
Uplink Modulations	LTE : QPSK, 16QAM
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 3.1.1
Antenna Type	Monopole Antenna
EUT Stage	Engineering Sample

Note:

1. All models are listed as below.

Product Name	Model	Brand
Airfinder Rechargeable SuperTag	LL-AF2-ST-SM-RTK02	AirFinder
	SM-RTK02	Sercomm

2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

3. SAR Measurement Evaluation

3.1 Maximum Target Conducted Power

3.1.1 Maximum Target Conducted Power

Mode	Maximum Target Power
LTE 2	23.40
LTE 4	23.44
LTE 12	24.57
LTE 13	24.84

3.1.2 Time-Avg. Power Calculation

The calculation of time-avg. power (Unit : dBm) including duty cycle.

<The calculation average power with duty cycle>

Mode	Frequency (MHz)	Antenna Gain (dBi)	Tune-up Power (Not include Duty Cycle)		Duty Cycle %	Calculated Max Time-Avg. power (Include Duty Cycle)	
			Target Power (dBm)	ERP (dBm)		(dBm)	(mW)
LTE 2	1910	1.40	23.40	22.65	0.00042	-30.3675	0.00092
LTE 4	1755	2.70	23.44	23.99	0.00042	-29.7775 ERP	0.00105
LTE 12	716	-4.10	24.57	18.32	0.00042	-29.1975	0.00120
LTE 13	787	-2.90	24.84	19.79	0.00042	-28.9275	0.00128

Note:

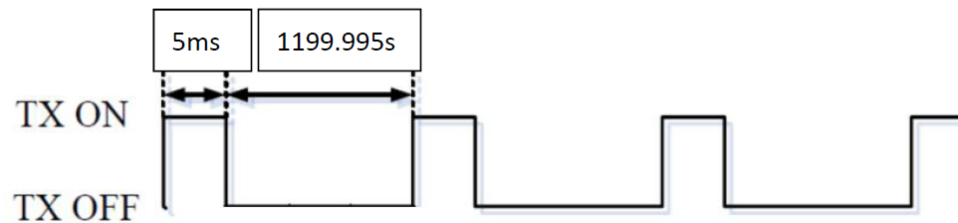
- The Duty Cycle=0.00042% is the worst condition for customer operation mode. Please refers to Operation Description by manufacturer.

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3.1.3 Duty Cycle Calculation

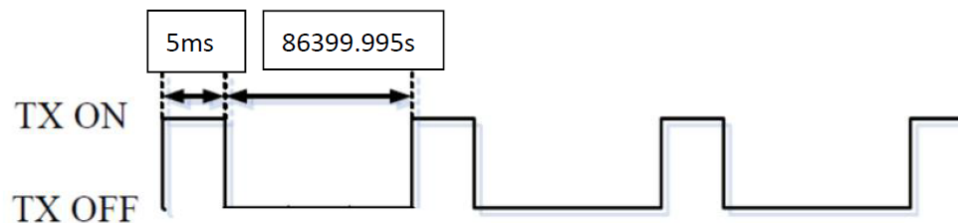
- For a period of 20 minutes, the maximum duty cycle yielded would be:

$$0.005s / [20 \text{ min} * 60s/\text{min}] = 0.0000041666 = 0.00042\%$$



- For a period of 24 hours, the maximum duty cycle yielded would be:

$$0.005s / [60s/\text{min} * 60\text{min}/\text{hr} * 24 \text{ hr}] = 0.00000005787 = 0.0000058\%$$



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3.2 SAR Testing Exclusions

According to FCC-19-126, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

1. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequency from 0.3 GHz to 6 GHz (inclusive).

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

Where

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

and

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

d = the separation distance (cm);

Mode	Max. Tune-up Power		Min. Distance to human body		
	(dBm)	(mW)	Ant. to Surface (mm)	Power Threshold (mW)	Require SAR Testing?
LTE 2	-30.3675	0.00092	5	3.3495	No
LTE 4	-29.7775	0.00105	5	3.58443	No
LTE 12	-29.1975	0.00120	5	11.4731	No
LTE 13	-28.9275	0.00128	5	10.0478	No

Note:

1. When the device output power is less than the power threshold shown in above table, the SAR testing exclusion is applied.
2. Units for d are cm and units for f are GHz.

Summary:

Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

4. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The road map of all our labs can be found in our web site also.

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