



RF Exposure Evaluation Declaration

Report No.: S20221129093611 Issue Date: 04-20-2023

Applicant: SBOT Technologies LLC

Address: 230 W 39th St, 8th FL, New York United States 10018

FCC ID: 2A3Q4-CA03AN

Application Type: Certification

Product: Caper Cart M3 Android board

Model No.: PCBA-CAP-CA03AN-RK39

Trade Mark: /

FCC Rule Part(s): CFR 47, FCC Part 2.1091 Radio frequency radiation

exposure evaluation: mobile devices.

Test Date: Feb 19 ~ Feb 23, 2023

Compiled By

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Senior Test Engineer

Approved By

(Line Chen)

Engineer Manager

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd. Wuxi Branch

The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.

TRF No.:FG.WI-07- FCC Part 2.1091

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Page Number: 1 of 8



Revision History

Report No.	Version	Description	Issue Date
S20221129093611	Rev. 01	/	04-20-2023

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1. Product Information

1.1. Equipment Description

Product Name:	Caper Cart M3 Android board	
Model No.:	PCBA-CAP-CA03AN-RK39	
Trade Mark:	/	
Input Voltage Range:	DC 24V	
Bluetooth Version:	5.0	
	802.11b/g/n-HT20	
Wi-Fi Specification:	802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80/ax-HE20/	
	ax-HE40/ax-HE80	

1.2. Product Specification Subjective to this Report

Frequency Range:	BT/BLE:2402~2480MHz				
	802.11b/g/n-HT20: 2412 ~ 2462MHz				
	For 802.11a/n-HT20/ac-VHT20/ax-HE20:				
	5180~5240MHz, 5745~5825MHz				
	For 802.11n-HT40/ac-VHT40/ax-HE40:				
	5190~5230MHz, 5755~5795MHz				
	For 802.11ac-VHT80/ax-HE80:				
	5210MHz, 5775MHz				
	BLE:GFSK				
	BT: GFSK, Π/4 DQPSK, 8DPSK				
True a of Mandrilation.	802.11b: DSSS				
Type of Modulation:	802.11g/n: OFDM				
	802.11a/n/ac/ax:CCK/OFDM/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QA				
	M/256QAM/1024QAM				
Data Rate:	BLE:1Mbps&2Mbps				
	BT:1Mbps(GFSK), 2Mbps(Π/4 DQPSK), 3Mbps (8DPSK)				
	802.11b: 1/2/5.5/11Mbps				
	802.11g: 6/9/12/18/24/36/48/54Mbps				
	802.11n: MCS0~MCS7				
	802.11a: 6/9/12/18/24/36/48/54Mbps				
	802.11n: up to 150Mbps				
	802.11ac: up to 433.3Mbps				
	802.11ax: up to 600Mbps				

Page Number: 3 of 8



Antenna Type:	FPC Antenna
Antenna Gain:	BT/BLE:6.22dBi
	2.4G WiFi:
	Ant1:6.22dBi
	Ant2:3.61dBi
	5G RLAN:
	Ant1:4.48dBi
	Ant2:6.15dBi



2. RF Exposure Evaluation

2.1. Evaluation Method

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit Device Type: Mobile Device

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D04 Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1)

$$\sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1$$
 (C.1)

Evaluated k the maximum reported SAR or MPE of fixed, mobile, or portable RF source k

either in the device or at the transmitter site from an existing evaluation.
either the general population/uncontrolled maximum permissible exposure

Exposure either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or

portable sources, as applicable

the sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE shall be less than 1, to determine simultaneous transmission exposure compliance

2.2. Limit

For mobile devices at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in Table B.2 is necessary if the ERP of the device is greater than ERP20cm in Formula (B.1)

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



(B.2)Limits for General Population/Uncontrolled Exposure

Frequency	Electric Field	Magnetic Field	Power Density	Averaging Time
Range	Strength (E)	Strength(H)	(S)	(minutes)
(MHz)	(V/m)	(A/m)	(mW/cm ²)	
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	1	1	F/1500	30
1500-100,000	1	1	1.0	30

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

2.3. Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

S=PG/4πR²

Where: S=power density P=power input to antenna

G=power gain of the antenna in the direction of interest relative to anisotropic radiator

R=distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the maximum gain of the used as following information, the RF power density can be obtained.



3. Estimation Result

3.1. Measurement Results

STANDALONE MPE

STANDALONE INFL							
	Frequency (MHz)	Maximum	Conducted Antenna Gain	PG		MPE	MPE
Mode		OutputPower		(dBm)	(mW)	(mW/cm ²)	Limits (mW/cm ²)
WCDMA Band 2	1850 - 1910	25	4.33	29.33	857.038	0.171	1.00
WCDMA Band 4	1710 -1755	25	4.33	29.33	857.038	0.171	1.00
WCDMA Band 5	824 - 849	25	4.33	29.33	857.038	0.171	0.55
FDD LTE Band	1850 - 1910	25	4.33	29.33	857.038	0.171	1.00
FDD LTE Band	1710 -1755	25	4.33	29.33	857.038	0.171	1.00
FDD LTE Band 5	824 - 849	25	4.33	29.33	857.038	0.171	0.55
FDD LTE Band 12	699 - 716	25	4.33	29.33	857.038	0.171	0.47
FDD LTE Band 13	777 - 787	25	4.33	29.33	857.038	0.171	0.52
FDD LTE Band 14	788 - 798	25	4.33	29.33	857.038	0.171	0.53
TDD LTE Band 66	1710 - 1780	25	4.33	29.33	857.038	0.171	1.00
TDD LTE Band	663 - 698	25	4.33	29.33	857.038	0.171	0.45
2.4 GHz WIFI	2412 - 2462	13.77	6.22	19.99	97.724	0.019	1.00
U-NII	5150 - 5250 5745 - 5825	Ant1:13.22 Ant2: 13.67	Ant1:4.48 Ant2:6.15	Total:21.90	154.882	0.031	1.00
BT	2402 - 2480	7.16	6.22	13.38	21.777	0.004	1.00
BLE	2402 - 2480	6.07	6.22	12.29	16.943	0.003	1.00

Remark: 1. MPE use distance is 20cm from manufacturer declaration of user manual.

Remark: 2.Use the maximum gain of all bands when evaluating



Note: The estimation distance is 20cm.

Maximum Simultaneous transmission MPE Ratio for WWLAN & WLAN & BT(BR+EDR&BLE)

	Maximum MPE ratio	Maximum MPE ratio	Maximum MPE ratio	Maximum MPE ratio	∑ MPE	Limit	Results
	(LTE Band 12)	(5 GHz WIFI)	(2.4 GHz WIFI)	(BT)	ratios		
Ī	0.171/0.47	0.031/1	0.019/1	0.004/1	0.418	1.000	Pass

——— The End