RF EXPOSURE
Test Report

Report No.:	MTi221017008-04E2
Date of issue:	2023-03-20
Applicant:	Shenzhen Voltnex Innovations Technology Co., Ltd
Product:	Hako 600 Portable Power Station
Model(s):	HK600
FCC ID:	2A7WR-HAKO600

Shenzhen Microtest Co., Ltd.

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Test Result Certification	
Applicant:	**Shenzhen Voltnex Innovations Technology Co., Ltd**
Address:	Room 3101, Tower 6, Tianan Cloud Part Phase II, Bantian Street, Longgang District, Shenzhen.
Manufacturer:	**SHENZHEN AMC TECHNOLOGY CO., LTD**
Address:	(1-7/F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Factory:	**SHENZHEN AMC TECHNOLOGY CO., LTD**
Address:	(1-7/F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Product description	
Product name:	Hako 600 Portable Power Station
Trademark:	VOLTME
Model name:	HK600
Serial Model:	N/A
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2022-12-15 ~ 2022-12-22
Test result:	Pass

Test Engineer : Yanice Xie

(Yanice Xie)

Reviewed By: : Leon Chen

(Leon Chen)

Approved By: : Tom Xue

(Tom Xue)

RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

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

MPE Calculation Method

Friis transmission formula: $Pd= (Pout*G)\ (4*pi*R^2)$

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1415926

R= distance between observation point and center of the radiator in cm(20cm)

Pd the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm^2

Antenna Type: PCB Antenna;

Antenna gain: 0.89dBi

R=20cm

mW=10^(dBm/10)

antenna gain Numeric=10^(dBi/10)= 10^(0.89/10)=1.23

BLE:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power		Antenna Gain		Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	8.97	8±1	9	7.943	0.89	1.23	0.0019	1
2440		8.71	8±1	9	7.943	0.89	1.23	0.0019	1
2480		8.92	8±1	9	7.943	0.89	1.23	0.0019	1
2402	BLE-2M	8.65	8±1	9	7.943	0.89	1.23	0.0019	1
2440		8.75	8±1	9	7.943	0.89	1.23	0.0019	1
2480		8.9	8±1	9	7.943	0.89	1.23	0.0019	1

Conclusion:

For the max result: 0.0019≤ 1.0 SAR, No SAR is required.

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