

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2405000485AT
Applicant: The House of Marley. LLC
Address of Applicant: 3000 Pontiac Trail, Commerce Township, Michigan 48390 United States
Manufacturer: The House of Marley. LLC
Address of Manufacturer: 3000 Pontiac Trail, Commerce Township, Michigan 48390 United States
Factory: Shenzhen Great Power Innovation And Technology Enterprise Co., Ltd.
Address of Factory: No. 331, Guiyue Road, Dafu Community, Guanlan Street, Longhua District, Shenzhen
Product Name: Roots Solar, Rise up Solar
Model No.: Roots Solar: EM-JA023,
Rise up Solar: EM-JA035 ♣
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Trade Mark:  , Marley
Standard(s) : KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2024-05-16
Date of Evaluation: 2024-05-21 to 2024-06-19
Date of Issue: 2024-07-09

Evaluation Result:**Pass***

* In the configuration evaluated, the EUT complied with the standards specified above.



Ricky Liu
Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center EEC Laboratory

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Revision Record			
Version	Report No.	Date	Remark
01	GZCR240500048504	2024-07-09	Original

Authorized for issue by:			
		Pank Feng	
		Pank Feng/Project Engineer	
		Vico Cui	
		Vico Cui/Reviewer	

2 Evaluation Summary

Item	Standard	Method	Requirement	Result
RF Exposure	KDB447498D01 General RF Exposure Guidance v06	KDB447498D01 General RF Exposure Guidance v06	KDB447498D01 General RF Exposure Guidance v06	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

♣Declaration of EUT Family Grouping:

Model No.: EM-JA023, EM-JA035

According to the declaration of the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the model name

Therefore only one EM-JA023 was tested in this report.

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4 General Information

4.1 Details of E.U.T.

Power supply: DC 5V for charging (power by AC/DC adaptor provided lab)
 Battery operation: DC 3.7V internal rechargeable battery as below:
 Model: 18650
 Rated: DC 3.7V, 9.62Wh, 2600mAh

Antenna Type: PCB Antenna
 Antenna Gain: -0.58dBi according to antenna specification
 Antenna Number: 1

For BT
 Operation Frequency: 2402MHz to 2480MHz
 Modulation Type: GFSK, pi/4DQPSK, 8DPSK
 Number of Channels: 79
 Channel Spacing: 1MHz
 Spectrum Spread Technology: Frequency Hopping Spread Spectrum(FHSS)

For BLE
 Operation Frequency: 2402MHz to 2480MHz
 Modulation Type: GFSK
 Number of Channels: 40
 Channel Spacing: 2MHz

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Evaluating Location

All tests were performed at:
 SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
 No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,
 Guangdong, China 510663
 Tel: +86 20 82155555
 No tests were sub-contracted.



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4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None



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5 Technical Requirements Specification

5.1 General Description of Applied Standards

KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.2 RF Exposure Evaluation

5.2.1 Limit & Test Method

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—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 Exposures				
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
300–1500			f/300	6
1500–100,000			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
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * P_i * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

P_i = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



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5.2.2 Conclusion

The BLE and BT function can not be transmitted simultaneously, so

The Maximum Conducted Peak Output Power is 2.66 dBm in channel 2.402 GHz;

2.66 Bm logarithmic terms convert to numeric result is nearly 1.845 mW

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$

General RF Exposure = $(1.845 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.402 \text{ GHz}} = 0.572$ ① ;

SAR requirement: $S = 3.0$ ② ;

$\therefore$ ① < ②.

$\therefore$ the SAR report is not required.

Note: Refer to report No. GZCR240500048502 for EUT test Max Conducted Peak Output Power value.

6 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2405000485AT

- End of the Report -

