RF Exposure Report

FCC ID:	2AAGF-WILLEN
Applicant:	Zound Industries International AB
Address:	Centralplan 15 SE-111 20 Stockholm Sweden
Manufacturer:	Zound Industries International AB
Address:	Centralplan 15 SE-111 20 Stockholm Sweden
Product:	Portable Loudspeaker
Brand:	Marshall
Test Model(s):	WILLEN
Series Model(s):	N/A
Test Date:	Jan. 12, 2022 ~ Feb. 11, 2022
Issued Date:	Feb. 11, 2022
Issued By:	Hwa-Hsing (Dongguan) Testing Co., Ltd.
Address:	No.101, Bld N1, Yuyuan 2Rd, Yuyuan Industrial Park, HuangJiang Town, Dongguan, China
Test Firm Registration No.:	915896
Standards:	FCC Part 2 (Section 2.1091); KDB 447498 D01; IEEE C95.1

The above equipment has been tested by **Hwa-Hsing (Dongguan) Testing Co., Ltd.**, 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 EMC characteristics under the conditions specified in this report.

Prepared by : Candy Zhang

Candy Zhang/ Report Engineer

Reviewed by : Tank Tan

Tank tan/ Project Engineer

Approved by :

Harry Li/ Technical Director

Table of contents

Release control record

Issue No.	Reason for change	Date issued
210427EL31-SE-US-01	Original Release	Feb. 13, 2022

1 General Information

1.1 General Description of EUT

Product	Portable Loudspeaker
Brand	Marshall
Test Model(s)	WILLEN
Series Model(s)	N/A
Status of EUT	Engineering Prototype
Power Supply Rating	DC 3.7V from Li-ion Battery or DC 5V from USB port
Modulation Type	GFSK, π/4DQPSK,8DPSK
Transfer Rate	1/2/3Mbps
Operating Frequency	2402 ~ 2480MHz
Number of Channel	BLE: 40 EDR: 79
Output Power（AVG）	6.57dBm
Antenna Type	FPCB Antenna
Antenna Gain	3.69dBi Maximum peak Gain
Antenna Connector	N/A
Accessory Device	N/A
Cable Supplied	USB Cable: Unshielded, 50cm

Note:

1. Please refer to the EUT photo document (Reference No.: 210427EL31-1&-2) for detailed product photo.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

2 Evaluation of SAR Testing Exclusion

Following FCC KDB 447498 D01 “General SAR test exclusion guidance”
The corresponding SAR Exclusion Threshold condition, listed below:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- ☐ f(GHz) is the RF channel transmit frequency in GHz
- ☐ Power and distance are rounded to the nearest mW and mm before calculation
- ☐ The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:
a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100MHz to 1500 MHz
b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion.
a) The threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by [1 + log(100/f(MHz))] for test separation distances > 50 mm and < 200 mm.
b) The threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by ½ for test separation distances ≤ 50 mm.
c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

Smallest distance from the antenna and radiating structures or outer surface of the device
The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.

3 Evaluation Result

The tuned conducted Average Power (declared by client)

Wireless Function	Frequency (MHz)	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
Bluetooth	2402-2480	4	+3 -3	1	7

The measured conducted Average Power and EIRP

Wireless Function	Frequency (MHz)	Maximum Averaged Power (dBm)
BR/EDR	2402-2480	6.57

SAR Test Exclusion Thresholds

Frequency (MHz)	Maximum source-based time averaged conducted output power (dBm)	Minimum separation distance (mm)	Result of Eq. 1	Limit for 1-g SAR	Limit for 10-g extremity SAR	Verdict
2480	7	5	1.579	3.0	7.5	Exempt

Appendix – Information on the Testing Laboratories

We, Hwa-Hsing (Dongguan) Co., Ltd., A global provider of TESTING and CERTIFICATION services for consumer products, electronic products and wireless information technology products. Adhering to the core values “HONEST and TRUSTWORTHY, OBJECTIVE and IMPARTIALITY, RIGOROUS and AFFICIENT”, commitment to provide professional, perfect and efficient comprehensive ONE-STOP solution of TESTING and CERTIFICATION services for Manufacturers, Buyers, Traders, Brands, Retailers. Assist client to better manage risk, protect their brands, reduce costs and cut time to over 150 markets in global. Our laboratories are FCC recognized accredited test firms and 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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