

## RF Exposure Report

FCC ID: 2BBQK-HEDDON

Applicant: Marshall Group AB

Address: Centralplan 15 111 20 Stockholm Sweden

Manufacturer: Marshall Group AB

Address: Centralplan 15 111 20 Stockholm Sweden

Product(s): MUSIC STREAMING HUB

Brand: Marshall

Test Model(s): HEDDON

Series Model(s): N/A

Test Date: Dec. 05, 2024 ~ Apr. 15, 2025

Issued Date: Apr. 16, 2025

Issued By: Hwa-Hsing (Dongguan) Testing Co., Ltd.

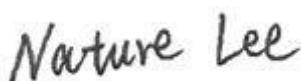
Address: No.101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China

Test Firm Registration No.: 915896

Standards: FCC Part 2(Section 2.1093)  
KDB 447498 D01 General RF Exposure Guidance v06

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.

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**Release control record**

Issue No.	Reason for change	Date Issued
2411050494-SE-US-01	Original Release	Apr. 16, 2025

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Ver. 1.4

## 1 General Information

### 1.1 General Description of EUT

Product(s)	MUSIC STREAMING HUB
Test Model(s)	HEDDON
Sample No.	HS2411050494-S002, HS2411050494-S003
Series Model(s)	N/A
Status of EUT	Engineering Prototype
Power Supply Rating	AC 100-240V ~ 50/60Hz, 10W
Modulation Type	GFSK for FHSS(BLE)
Transfer Rate	1Mbps, 2Mbps
Operating Frequency	1M: 2402 ~ 2480MHz 2M: 2404 ~ 2478MHz
Number of Channel	40 for 1Mbps 37 for 2Mbps
Maximum Output Power (Peak)	12.946dBm-Peak
Antenna Type and Antenna Gain	Internal Antenna, 2.96dBi
Antenna Connector	N/A
Accessory Device	N/A
Cable Supplied	AC Cable: Detachable, Unshielded, 200cm

Note:

1. Please refer to the EUT photo document (Reference No.: 2411050494-01&02) 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.

Hwa-Hsing (Dongguan) Testing Co., Ltd. is not responsible for the accuracy of the information provided by the manufacturer.

## 2 RF exposure limit

Limits for maximum permissible exposure (MPE)

Limits for general population / uncontrolled exposure				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Average time (minutes)
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30
Note: F = Frequency in MHz				

### 2.1 MPE calculation formula

$$Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$$

Where:

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

### Classification:

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

### 3 Calculation SAR test exclusion thresholds

The antennas provided to the EUT, please refer to the following table:

Function	Transmit and Receive Chain	Antenna Gain (dBi)	Maximum Power		Distance (cm)	Power density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
			(dBm)	(mW)			
FHSS	1TX,1RX	2.96	12.946	19.706	20	0.007750	1.0

The EUT had been contain another wireless module(FCC ID: 2AJYB-S1832) .

Wireless Function	Frequency Band(MHz)	Antenna	Maximum Conducted Power(mW)
Bluetooth	2402~2480	1	12.59
Bluetooth	2402~2480	2	12.59
BLE	2402~2480	1	13.49
BLE	2402~2480	2	13.49
WIFI2.4G	2412~2462	1	43.65
WIFI2.4G	2412~2462	2	43.65
WIFI5G	5180~5825	1	28.84
WIFI5G	5180~5825	2	28.84

Function	Max power (dBm)	Antenna gain (dBi)	Antenna	Distance (cm)	Power density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Bluetooth	12	2.56	1	20	0.005685	1.0
Bluetooth	12	2.56	2	20	0.005685	1.0
BLE	12	2.56	1	20	0.005685	1.0
BLE	12	2.56	2	20	0.005685	1.0
WIFI2.4G	17	2.56	1	20	0.017977	1.0
WIFI2.4G	17	2.56	2	20	0.017977	1.0
WIFI5G	15	3.92	1	20	0.015514	1.0
WIFI5G	15	3.92	2	20	0.015514	1.0

**Note:** The above wireless function can be transmission simultaneous.

Worst situation is  $(0.007750/1) + (0.005685/1) + (0.005685/1) + (0.005685/1) + (0.005685/1) + (0.017977/1) + (0.017977/1) + (0.015514/1) + (0.015514/1) = 0.097473$  , which is less than the limit.

#### Conclusion:

Therefore, the worst-case situation is **0.097473** mW/cm<sup>2</sup>, which is less than "1". This confirmed that the device compliance with FCC 1.1310 MPE limit.

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Release  
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**Appendix – Information on the Testing Laboratories**

We, [Hwa-Hsing \(Dongguan\) Testing 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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