

RF EXPOSURE REPORT

FOR

| | | |
|-----------------------------|---|---|
| Applicant | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |
| Equipment under Test | : | WIRELESS SPEAKER |
| Model No. | : | JBL QUANTUM DUO |
| Trade Mark | : | JBL |
| FCC ID | : | APIJBLQTMDUO |
| Manufacturer | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan
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REPORT

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TEST REPORT DECLARE

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

| | | | |
|-------------------------|-------------------|----------------------|-------------------------------|
| Report No: | DDT-R19091707-1E8 | | |
| Date of Receipt: | Sep. 04, 2019 | Date of Test: | Sep. 04, 2019 ~ Oct. 20, 2019 |

Prepared By:

Talent Zhang

Talent Zhang/Engineer



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision history

| Rev. | Revisions | Issue Date | Revised By |
|------|---------------|---------------|------------|
| --- | Initial issue | Dec. 19, 2019 | |
| | | | |

1. General information

1.1. Description of Equipment

| | |
|--------------------------|---|
| EUT* Name | : WIRELESS SPEAKER |
| Model Number | : JBL QUANTUM DUO |
| EUT function description | : Please reference user manual of this device |
| Power supply | : 100-240V~, 50/60Hz |
| Radio Specification | : Bluetooth V4.2 |
| Operation frequency | : 2402MHz-2480MHz |
| Modulation | : GFSK, $\pi/4$ -DQPSK, 8DPSK |
| Data rate | : 1 Mbps, 2 Mbps, 3 Mbps |
| Antenna Type | : Dedicated FPCB antenna, maximum PK gain: 5.04 dBi |
| Sample Type | : Series production |

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

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2. RF Exposure evaluation

2.1. Requirement

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.

Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm ²) | Averaging Time E ² , H ² or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|---|---|
| 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 | | | F/1500 | 30 |
| 1500-100,000 | | | 1.0 | 30 |

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

2.2. Calculation Method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation Result

Manufacturing Tolerance

| GFSK (Peak) | | | |
|----------------------|-----------|------------|------------|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 6 | 6 | 6 |
| Tolerance \pm (dB) | 1 | 1 | 1 |
| $\pi/4$ DQPSK (Peak) | | | |
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 6 | 6 | 6 |
| Tolerance \pm (dB) | 1 | 1 | 1 |
| 8DPSK (Peak) | | | |
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 6 | 6 | 6 |
| Tolerance \pm (dB) | 1 | 1 | 1 |

Estimation Result

| Mode | F (GHz) | Distance (mm) | RF output power | | Antenna Gain (dBi) | Antenna Gain (linear) | MPE Values (mW/cm ²) | MPE limits (mW/cm ²) | MPE Test Exclusion |
|------|---------|---------------|-----------------|------|--------------------|-----------------------|----------------------------------|----------------------------------|--------------------|
| | | | dBm | mW | | | | | |
| BDR | 2.441 | 20 | 7.00 | 5.01 | 5.04 | 3.19 | 0.0032 | 1 | Yes |
| EDR | 2.441 | 20 | 7.00 | 5.01 | 5.04 | 3.19 | 0.0032 | 1 | Yes |

Note: The estimation distance is 20cm

END OF REPORT