

## RF EXPOSURE REPORT

### FOR

|                      |   |                                                               |
|----------------------|---|---------------------------------------------------------------|
| Applicant            | : | Harman International Industries, Inc.                         |
| Address              | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES |
| Equipment under Test | : | Wireless Multi-Channel Soundbar                               |
| Model No.            | : | CITATION MULTIBEAM 700                                        |
| Trade Mark           | : | harman/kardon                                                 |
| FCC ID               | : | APIHKMB700A                                                   |
| Manufacturer         | : | Harman International Industries, Inc.                         |
| Address              | : | 8500 Balboa Boulevard, Northridge, CA 91329,<br>UNITED STATES |

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

**Add.:** No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,  
Dongguan City, Guangdong Province, China, 523808

**Tel.:** +86-0769-38826678, **E-mail:** ddt@dgddt.com, <http://www.dgddt.com>

# REPORT

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## Test Report Declare

|                             |   |                                                            |
|-----------------------------|---|------------------------------------------------------------|
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| <b>Model No.</b>            | : | CITATION MULTIBEAM 700                                     |
| <b>Trade Mark</b>           | : | harman/kardon                                              |
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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.**

|                         |                     |                      |                               |
|-------------------------|---------------------|----------------------|-------------------------------|
| <b>Report No:</b>       | DDT-RE23082223-2E05 |                      |                               |
| <b>Date of Receipt:</b> | Sep. 04, 2023       | <b>Date of Test:</b> | Sep. 04, 2023 ~ Sep. 22, 2023 |

**Prepared By:**

**Approved By:**

*Ella Gong*

**Ella Gong /Engineer**

*Damon Hu*

**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 | Sep. 22, 2023 |            |
|      |               |               |            |

## 1. General Information

### 1.1. Description of equipment

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT Name                 | : Wireless Multi-Channel Soundbar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Model Number             | : CITATION MULTIBEAM 700                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| EUT function description | : Please reference user manual of this device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power Supply             | : AC 100-240V, 50-60Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Radio Technology         | : Bluetooth V5.1, IEEE 802.11b/g/n, IEEE 802.11a/n/ac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operation frequency      | BT:<br>2402 MHz - 2480 MHz<br>WIFI:<br>IEEE 802.11b: 2412MHz-2462MHz<br>IEEE 802.11g: 2412MHz-2462MHz<br>IEEE 802.11n HT20: 2412MHz-2462MHz<br>IEEE 802.11a: 5180MHz-5240MHz, 5260MHz-5320MHz,<br>5500MHz-5720MHz, 5745MHz-5825MHz<br>IEEE 802.11n HT20: 5180MHz-5240MHz, 5260MHz-5320MHz,<br>5500MHz-5720MHz, 5745MHz-5825MHz<br>IEEE 802.11n HT40: 5190MHz-5230MHz, 5270MHz-5310MHz,<br>5510MHz-5710MHz, 5755MHz-5795MHz<br>IEEE 802.11ac VHT20: 5180MHz-5240MHz, 5260MHz-5320MHz,<br>5500MHz-5720MHz, 5745MHz-5825MHz<br>IEEE 802.11ac VHT40: 5190MHz-5230MHz, 5270MHz-5310MHz,<br>5510MHz-5710MHz, 5755MHz-5795MHz<br>IEEE 802.11ac VHT80: 5210MHz, 5290MHz, 5530MHz,5610MHz,<br>5690MHz, 5775MHz |
| Modulation               | BT:<br>GFSK, $\pi/4$ -DQPSK, 8DPSK<br>WIFI:<br>IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)                                                                                                                                                                                                                                                                                                                                                                                         |
| Transmitter rate         | BT:<br>1 Mbps, 2 Mbps, 3 Mbps<br>WIFI:<br>IEEE 802.11b: up to 11 Mbps<br>IEEE 802.11g: up to 54 Mbps<br>IEEE 802.11a: up to 54 Mbps<br>IEEE 802.11n HT20: up to 144.4 Mbps<br>IEEE 802.11n HT40: up to 300 Mbps<br>IEEE 802.11ac VHT20: up to 173.4 Mbps<br>IEEE 802.11ac VHT40: up to 400 Mbps<br>IEEE 802.11ac VHT80: up to 866.6 Mbps                                                                                                                                                                                                                                                                                                                                                              |
| Antenna                  | BT:<br>FPC antenna, maximum PK gain: 2.64 dBi<br>2.4G WIFI:<br>Antenna 1: FPC antenna, Maximum PK gain: 2.64 dBi<br>Antenna 2: FPC antenna, Maximum PK gain: 2.36 dBi<br>5G WIFI:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|               |                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Antenna 1: FPC antenna, Maximum PK gain: 3.24 dBi<br>Antenna 2: FPC antenna, Maximum PK gain: 3.68 dBi                                                                                                     |
| TPC           | : <input type="checkbox"/> Support <input checked="" type="checkbox"/> Not support                                                                                                                         |
| SISO Mode     | : <input checked="" type="checkbox"/> 11a <input checked="" type="checkbox"/> 11b <input checked="" type="checkbox"/> 11g <input checked="" type="checkbox"/> 11n <input checked="" type="checkbox"/> 11ac |
| MIMO Mode     | : <input type="checkbox"/> 11a <input type="checkbox"/> 11b <input type="checkbox"/> 11g <input checked="" type="checkbox"/> 11n <input checked="" type="checkbox"/> 11ac                                  |
| Sample Number | : S23082223-02 for conductive,<br>S23082223-01 for radiation                                                                                                                                               |

Note: EUT is the abbreviation of equipment under test.

## 1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,  
Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

## 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 0.2 m 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> 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 m, as well as the gain of the used antenna, the RF power density can be obtained.

**2.3. Estimation result**

| Mode      | Output power (dBm) | Output power (mW) | tune up power (dBm) | Antenna Gain (dBi) | Antenna Gain (linear) | MPE Values (mW/cm <sup>2</sup> ) | MPE Limit (mW/cm <sup>2</sup> ) |
|-----------|--------------------|-------------------|---------------------|--------------------|-----------------------|----------------------------------|---------------------------------|
| BT        | 8.76               | 7.52              | 9                   | 2.64               | 1.84                  | 0.00290                          | 1                               |
| BLE       | 7.13               | 5.16              | 8.5                 | 2.64               | 1.84                  | 0.00259                          | 1                               |
| 2.4G WIFI | 15.04              | 31.92             | 16                  | 5.51               | 3.56                  | 0.02818                          | 1                               |
| 5G WIFI   | 15.91              | 38.99             | 16.5                | 6.48               | 4.45                  | 0.03953                          | 1                               |

**Maximum MPE Ratios for BT, WLAN and WISA simultaneous transmission**

| Maximum MPE Ratio <sub>WLAN</sub> | Maximum MPE Ratio <sub>WISA</sub> | Σ MPE ratios | Limit | Results |
|-----------------------------------|-----------------------------------|--------------|-------|---------|
| 0.03953                           | 0.00470                           | 0.04423      | 1.0   | PASS    |

Remark:

1. Maximum power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.
3. Maximum MPE Ratio <sub>WISA</sub> from FCC ID: UA9800 (Report No.: FOCU0169.1);

Conclusion: MPE evaluation required since transmitter power is below FCC threshold

**END OF REPORT**