

## FCC 47 CFR MPE REPORT

INMUSIC BRANDS INC

2000-WATT 10" 2-Way POWERED LOUDSPEAKER

Model Number: TS410

Additional Model: TS04, TS\*\*\*\*\* (“\*” can be “a-z”, “A-Z”, “0-9”, blank, “-”)

FCC ID: Y4O-TS04

|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| Applicant:               | INMUSIC BRANDS INC                                                  |
| Address:                 | 200 SCENIC VIEW DRIVE, SUITE 201, CUMBERLAND,                       |
|                          | Rhode Island 02864, United States                                   |
|                          |                                                                     |
| Prepared By:             | EST Technology Co., Ltd.                                            |
|                          | Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |
| Tel: 86-769-83081888-808 |                                                                     |

|                 |                             |
|-----------------|-----------------------------|
| Report Number:  | ESTE-R2201034               |
| Date of Test:   | Nov. 17, 2021~Jan. 04, 2022 |
| Date of Report: | Jan. 07, 2022               |

## Maximum Permissible Exposure

### 1. Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

#### 1.1. Limits for Maximum Permissible Exposure (MPE)

##### (a) Limits for Occupational/Controlled 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 Times $ E ^2$ , $ H ^2$ or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|--------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                  | 6                                                |
| 3.0-30                | 1842/f                            | 4.89/f                            | (900/f)*                                | 6                                                |
| 30-300                | 61.4                              | 0.163                             | 1.0                                     | 6                                                |
| 300-1500              |                                   |                                   | F/300                                   | 6                                                |
| 1500-10000            |                                   |                                   | 5                                       | 6                                                |

##### (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 Times $ 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                                               |
| 1500-10000            |                                   |                                   | 1.0                                     | 30                                               |

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

## 1.2. MPE Calculation Method

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

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

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

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

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

## 2. Conducted Power Result

| Mode           | Frequency<br>(MHz) | Peak output power<br>(dBm) | Peak output<br>power (mW) | Target power<br>(dBm) | Antenna gain |          |
|----------------|--------------------|----------------------------|---------------------------|-----------------------|--------------|----------|
|                |                    |                            |                           |                       | (dBi)        | (Linear) |
| GFSK           | 2402               | 1.58                       | 1.439                     | 1±1                   | 2            | 1.585    |
|                | 2441               | 2.44                       | 1.754                     | 2±1                   | 2            | 1.585    |
|                | 2480               | 2.66                       | 1.845                     | 2±1                   | 2            | 1.585    |
| $\pi/4$ -DQPSK | 2402               | 2.33                       | 1.710                     | 2±1                   | 2            | 1.585    |
|                | 2441               | 3.19                       | 2.084                     | 3±1                   | 2            | 1.585    |
|                | 2480               | 3.39                       | 2.183                     | 3±1                   | 2            | 1.585    |
| BLE            | 2402               | 1.44                       | 1.393                     | 1±1                   | 2            | 1.585    |
|                | 2440               | 2.28                       | 1.690                     | 2±1                   | 2            | 1.585    |
|                | 2480               | 2.51                       | 1.782                     | 2±1                   | 2            | 1.585    |

### 3. Calculated Result and Limit

| Mode           | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|----------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| 2.4G Band      |                    |              |          |                                         |                                                    |             |
| GFSK           | 3                  | 2            | 1.585    | 0.00063                                 | 1                                                  | Complies    |
| $\pi/4$ -DQPSK | 4                  | 2            | 1.585    | 0.00079                                 | 1                                                  | Complies    |
| BLE            | 3                  | 2            | 1.585    | 0.00063                                 | 1                                                  | Complies    |

**End of Test Report**