# FCC 47 CFR MPE REPORT

INNOVATIVE TECHNOLOGY ELECTRONICS LLC

Bluetooth Rock Speakers

Model Number: ITSBO-L513

FCC ID: 2AFHW-ITSBOL513

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| Report Number: | ESTE-R2007019 |
| Date of Test: | Jun. 28~Jul. 06, 2020 |
| Date of Report: | Jul. 07, 2020 |

# 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) ($mW/cm^2$) | 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) ($mW/cm^2$) | 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.o | 30 |

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

## 1.2. MPE Calculation Method

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

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

**Antenna 0**

| Mode | Frequency (MHz) | Peak output power (dBm) | Peak output power (mW) | Target power (dBm) | Antenna gain | |
|---|---|---|---|---|---|---|
| | | | | | (dBi) | (Linear) |
| GFSK | 2402 | -1.31 | 0.7396 | -1±1 | 1.9 | 1.5488 |
| | 2441 | -2.12 | 0.6138 | -2±1 | 1.9 | 1.5488 |
| | 2480 | -3.17 | 0.4819 | -3±1 | 1.9 | 1.5488 |
| 8-DPSK | 2402 | 1.81 | 1.5171 | 1±1 | 1.9 | 1.5488 |
| | 2441 | 0.86 | 1.2190 | 0±1 | 1.9 | 1.5488 |
| | 2480 | -0.24 | 0.9462 | 0±1 | 1.9 | 1.5488 |
| BLE | 2402 | -1.58 | 0.6950 | -1±1 | 1.9 | 1.5488 |
| | 2440 | -2.49 | 0.5636 | -2±1 | 1.9 | 1.5488 |
| | 2480 | -3.55 | 0.4416 | -3±1 | 1.9 | 1.5488 |

# 3. Calculated Result and Limit

**Antenna 0**

| Mode | Target power (dBm) | Antenna gain | | Power Density (S) ($mW/cm^2$) | Limited of Power Density (S) ($mW/cm^2$) | Test Result |
|---|---|---|---|---|---|---|
| | | (dBi) | (Linear) | | | |
| 2.4G Band | | | | | | |
| GFSK | 0 | 1.9 | 1.5488 | 0.00031 | 1 | Compiles |
| 8-DPSK | 2 | 1.9 | 1.5488 | 0.00049 | 1 | Compiles |
| BLE | 0 | 1.9 | 1.5488 | 0.00031 | 1 | Compiles |

**End of Test Report**