# FCC 47 CFR MPE REPORT

Circus World Displays Limited

Bluetooth Speaker

Model Number: RS61

FCC ID: SMH-RS61

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# Maximum Permissible Exposure

## 1、Applicable Standard

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.

**(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/cm2) | 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/cm2) | 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

## 2、MPE Calculation Method

E (V/m) = (30*P*G) 0.5/d  Power Density: Pd (W/m2) = E2/377

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 = (30*P*G) / (377*d2)

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

## 3、Conducted Power Result

| Mode | Frequency (MHz) | Peak output power (dBm) | Peak output power (mW) | Target power（dBm） | Antenna gain | |
|---|---|---|---|---|---|---|
| | | | | | (dBi) | (Linear) |
| GFSK | 2402 | 0.269 | 1.064 | 0±1 | 0 | 1 |
| | 2441 | 1.372 | 1.372 | 1±1 | 0 | 1 |
| | 2480 | 1.832 | 1.525 | 1±1 | 0 | 1 |
| 8-DPSK | 2402 | -0.942 | 0.805 | -1±1 | 0 | 1 |
| | 2441 | 0.694 | 1.173 | 0±1 | 0 | 1 |
| | 2480 | 1.166 | 1.308 | 1±1 | 0 | 1 |
| BLE | 2402 | -0.060 | 0.986 | -1±1 | 0 | 1 |
| | 2440 | 0.680 | 1.169 | 0±1 | 0 | 1 |
| | 2480 | 1.150 | 1.303 | 1±1 | 0 | 1 |

## 4、Calculated Result and Limit

| Mode | Target power（dBm） | Antenna gain | | Power Density (S) (mW /cm2) | Limited of Power Density (S) (mW /cm2) | Test Result |
|---|---|---|---|---|---|---|
| | | (dBi) | (Linear) | | | |
| GFSK | 2 | 0 | 1 | **0.00032** | 1 | Compiles |
| 8-DPSK | 2 | 0 | 1 | **0.00032** | 1 | Compiles |
| BLE | 2 | 0 | 1 | **0.00032** | 1 | Compiles |