

## FCC 47 CFR MPE REPORT

Microlab Electronics Co.,Ltd.

Wireless Subwoofer

Model Number: Sub 8

FCC ID: OR8-SUB8

|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
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|                          |                                                                     |
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|                 |                       |
|-----------------|-----------------------|
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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/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

### 2、MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5} / d \quad \text{Power Density: } P_d \text{ (W/m}^2\text{)} = E^2 / 377$$

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

$$P_d = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

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

**3、Conducted Power Result**

| Mode   | Frequency<br>(MHz) | Peak output power<br>(dBm) | Peak output power<br>(mW) | Target<br>power<br>( dBm ) | Antenna gain |          |
|--------|--------------------|----------------------------|---------------------------|----------------------------|--------------|----------|
|        |                    |                            |                           |                            | (dBi)        | (Linear) |
| GFSK   | 2402               | 2.68                       | 1.854                     | $2 \pm 1$                  | 0            | 1        |
|        | 2441               | 2.59                       | 1.816                     | $2 \pm 1$                  | 0            | 1        |
|        | 2480               | 2.61                       | 1.824                     | $2 \pm 1$                  | 0            | 1        |
| 8-DPSK | 2402               | 3.15                       | 2.065                     | $3 \pm 1$                  | 0            | 1        |
|        | 2441               | 3.16                       | 2.070                     | $3 \pm 1$                  | 0            | 1        |
|        | 2480               | 3.23                       | 2.104                     | $3 \pm 1$                  | 0            | 1        |

**4、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) |                                         |                                                    |             |
| GFSK   | 3                  | 0            | 1        | 0.00040                                 | 1                                                  | Compiles    |
| 8-DPSK | 4                  | 0            | 1        | 0.00050                                 | 1                                                  | Compiles    |