

## FCC 47 CFR MPE REPORT

VTech Electronics Limited

KIDISTAR BOOMBOX

Model Number: 5474

Additional Model: 80-547400;80-547403;80-547404;80-547405;80-547422;

80-547423;80-5474XX(XX=00~99)

FCC ID: G2R-5474

|                          |   |
|--------------------------|---|
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|                          |   |
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|                 |                  |
|-----------------|------------------|
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## 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   <sup>2</sup> ,   H   <sup>2</sup> 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   <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   |
| 1500-10000            |                                   |                                   | 1.0                                     | 30   |

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

## 1.2. MPE Calculation Method

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

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 (MHz) | Peak output power (dBm) | Peak output power (mW) | Target power (dBm) | Antenna gain |          |
|----------------|-----------------|-------------------------|------------------------|--------------------|--------------|----------|
|                |                 |                         |                        |                    | (dBi)        | (Linear) |
| GFSK           | 2402            | -1.41                   | 0.7228                 | $-1 \pm 1$         | 0            | 1        |
|                | 2441            | -2.14                   | 0.6109                 | $-2 \pm 1$         | 0            | 1        |
|                | 2480            | -3.00                   | 0.5012                 | $-3 \pm 1$         | 0            | 1        |
| $\pi/4$ -DQPSK | 2402            | 0.98                    | 1.2531                 | $0 \pm 1$          | 0            | 1        |
|                | 2441            | 0.21                    | 1.0495                 | $0 \pm 1$          | 0            | 1        |
|                | 2480            | -0.66                   | 0.8590                 | $0 \pm 1$          | 0            | 1        |

## 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      |                    |              |          |   |  |             |
| $\pi/4$ -DQPSK | 1                  | 0            | 1        | 0.0003                                  | 1  | Complies    |

**End of Test Report**