# Maximum Permissible Exposure Report

## 1. Product Information

| | | |
|---|---|---|
| EUT | : | Treadmill for home |
| Test Model | : | BA05 |
| Power Supply | : | Input: 100-120V~, 60Hz, 9500mA, 1000W |
| Hardware Version | : | V1.6 |
| Software Version | : | V1.1.3.0 |
| Bluetooth | | |
| Frequency Range | : | 2402MHz~2480MHz |
| Channel Number | : | 40 channels for Bluetooth V5.0 (DTS) |
| Channel Spacing | : | 2MHz for Bluetooth V5.0 (DTS) |
| Modulation Type | : | GFSK for Bluetooth V5.0 (DTS) |
| Bluetooth Version | : | V5.0 |
| Antenna Description | : | PCB Antenna, 3.26dBi (Max.) |
| WIFI(2.4G Band) | | |
| Frequency Range | : | 2412MHz~2462MHz |
| Channel Spacing | : | 5MHz |
| Channel Number | : | 11 Channels for 20MHz bandwidth (2412~2462MHz)<br>7 Channels for 40MHz bandwidth (2422~2452MHz) |
| Modulation Type | : | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Antenna Description | : | PCB Antenna, 3.26dBi (Max.) |
| Exposure category | : | General population/uncontrolled environment |
| EUT Type | : | Production Unit |
| Device Type | : | Mobile Devices |

## 2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

## 3. Limit

### 3. 1 Refer Evaluation Method

ANSI C95.1–2019: IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

### 3. 2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

| Frequency Range(MHz) | Electric Field Strength(V/m) | Magnetic Field Strength(A/m) | Power Density ($mW/cm^2$) | Averaging Time (minute) |
|---|---|---|---|---|
| Limits for Occupational/Controlled Exposure | | | | |
| 0.3 – 3.0 | 614 | 1.63 | (100) * | 6 |
| 3.0 – 30 | 1842/f | 4.89/f | ($900/f^2$)* | 6 |
| 30 – 300 | 61.4 | 0.163 | 1.0 | 6 |
| 300 – 1500 | / | / | f/300 | 6 |
| 1500 – 100,000 | / | / | 5 | 6 |

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

| Frequency Range(MHz) | Electric Field Strength(V/m) | Magnetic Field Strength(A/m) | Power Density ($mW/cm^2$) | Averaging Time (minute) |
|---|---|---|---|---|
| Limits for Occupational/Uncontrolled Exposure | | | | |
| 0.3 – 3.0 | 614 | 1.63 | (100) * | 30 |
| 3.0 – 30 | 824/f | 2.19/f | ($180/f^2$)* | 30 |
| 30 – 300 | 27.5 | 0.073 | 0.2 | 30 |
| 300 – 1500 | / | / | f/1500 | 30 |
| 1500 – 100,000 | / | / | 1.0 | 30 |

F=frequency in MHz
*=Plane-wave equivalent power density

## 4. MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to an isotropic radiator
R=distance to the center of radiation of the antenna

## 5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

| Internal/External Identification | Antenna type and antenna number | Operate frequency band | Maximum antenna gain | Notes |
|---|---|---|---|---|
| Internal | PCB Antenna | 2400-2500MHz | 3.26dBi | BT/WIFI Antenna |

## 6. Conducted Power

[BLE LE]

| Mode | Channel | Frequency (MHz) | Peak Conducted Output Power (dBm) |
|---|---|---|---|
| GFSK | 00 | 2402 | 0.31 |
| | 19 | 2440 | -0.62 |
| | 39 | 2480 | -1.13 |

[BT 2LE]

| Mode | Channel | Frequency (MHz) | Peak Conducted Output Power (dBm) |
|---|---|---|---|
| GFSK | 00 | 2402 | -0.66 |
| | 19 | 2440 | 0.70 |
| | 39 | 2480 | -0.36 |

[2.4G WLAN]

| Mode | Channel | Frequency (MHz) | Peak Conducted Output Power (dBm) |
|---|---|---|---|
| IEEE 802.11b | 1 | 2412 | 15.17 |
| | 6 | 2437 | 15.07 |
| | 11 | 2462 | 15.16 |
| IEEE 802.11g | 1 | 2412 | 14.49 |
| | 6 | 2437 | 14.59 |
| | 11 | 2462 | 13.84 |
| IEEE 802.11n HT20 | 1 | 2412 | 13.04 |
| | 6 | 2437 | 13.62 |
| | 11 | 2462 | 13.47 |
| IEEE 802.11n HT40 | 3 | 2422 | 12.65 |
| | 6 | 2437 | 12.53 |
| | 9 | 2452 | 12.12 |

## 7. Manufacturing Tolerance

[BLE]

| GFSK(Peak) | | | |
|---|---|---|---|
| Channel | Channel 00 | Channel 19 | Channel 39 |
| Target (dBm) | 0 | 0 | -1.0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |

[BT 2LE]

| GFSK(Peak) | | | |
|---|---|---|---|
| Channel | Channel 00 | Channel 19 | Channel 39 |
| Target (dBm) | 0 | 0 | 0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |

[2.4G WLAN]

| IEEE 802.11b(Peak) | | | |
|---|---|---|---|
| Channel | Channel 01 | Channel 06 | Channel 11 |
| Target (dBm) | 15.0 | 15.0 | 15.0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |
| IEEE 802.11g(Peak) | | | |
| Channel | Channel 01 | Channel 06 | Channel 11 |
| Target (dBm) | 14.0 | 14.0 | 13.0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |
| IEEE 802.11n20(Peak) | | | |
| Channel | Channel 01 | Channel 06 | Channel 11 |
| Target (dBm) | 13.0 | 13.0 | 13.0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |
| IEEE 802.11n40(Peak) | | | |
| Channel | Channel 03 | Channel 06 | Channel 09 |
| Target (dBm) | 12.0 | 12.0 | 12.0 |
| Tolerance ± (dB) | 1.0 | 1.0 | 1.0 |

## 8. Measurement Results

### 8.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[BLE]

| Modulation Type | Output power | | Antenna Gain (dBi) | Antenna Gain (linear) | MPE (mW/cm2) | MPE Limits (mW/cm2) |
|---|---|---|---|---|---|---|
| | dBm | mW | | | | |
| BLE | 1.0 | 1.2589 | 3.26 | 2.1184 | 0.0005 | 1.0000 |
| BT 2LE | 1.0 | 1.2589 | 3.26 | 2.1184 | 0.0005 | 1.0000 |

[2.4GWLAN]

| Modulation Type | Output power | | Antenna Gain (dBi) | Antenna Gain (linear) | MPE (mW/cm2) | MPE Limits (mW/cm2) |
|---|---|---|---|---|---|---|
| | dBm | mW | | | | |
| IEEE 802.11b | 16.0 | 39.8107 | 3.26 | 2.1184 | 0.0168 | 1.0000 |
| IEEE 802.11g | 15.0 | 31.6228 | 3.26 | 2.1184 | 0.0133 | 1.0000 |
| IEEE 802.11n HT20 | 14.0 | 25.1189 | 3.26 | 2.1184 | 0.0106 | 1.0000 |
| IEEE 802.11n HT40 | 13.0 | 19.9526 | 3.26 | 2.1184 | 0.0084 | 1.0000 |

*Remark:*
*1. Output power including tune-up tolerance;*
*2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;*
*3. MPE evaluate distance is 20cm from user manual provide by manufacturer.*

### 8.2 Simultaneous Transmission MPE Evaluation

The EUT equiped with one antenna. So no need consider simultaneous transmission.

## 9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

----------THE END OF REPORT----------