



## FCC RF EXPOSURE REPORT

Jingheng Tengwei (Huizhou) Electronic Technology Co., Ltd.

Mechanical Keyboard

Model Number: RK R99

Additional Model: K99

FCC ID: 2A4MQ-RKR99

|                          |                                                            |
|--------------------------|------------------------------------------------------------|
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|                          |                                                            |
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|                 |                                |
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## 1. Applicable Standards

FCC Part 2(Section 2.1093)

FCC KDB 447498 D04 Interim General RF Exposure Guidance v01

## 2. Exposure Evaluation of Portable or Mobile Devices

Human exposure to RF emissions from portable devices (47 CFR §2.1093), as defined by the FCC, must be evaluated with respect to the FCC-adopted limits for SAR. Evaluation of mobile devices, as defined by the FCC, may also be performed with respect to SAR limits, but in such cases it is usually simpler and more cost-effective to evaluate compliance with respect to field strength or power density limits. For certain devices that are designed to be used in both mobile and portable configurations similar to those described in 47 CFR §2.1091(d)(4), such as certain desktop phones and wireless modem modules, compliance for mobile configurations is also satisfied when the same device is evaluated for SAR compliance in portable configurations.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and  $f$  is in GHz,  $d$  is the separation distance (cm), and  $ERP_{20 \text{ cm}}$  is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

| Frequency (MHz) | Distance (mm) |    |    |    |     |     |     |     |     |     |     |
|-----------------|---------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|
|                 | 5             | 10 | 15 | 20 | 25  | 30  | 35  | 40  | 45  | 50  |     |
|                 | 300           | 39 | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
|                 | 450           | 22 | 44 | 67 | 89  | 112 | 135 | 158 | 180 | 203 | 226 |
|                 | 835           | 9  | 25 | 44 | 66  | 90  | 116 | 145 | 175 | 207 | 240 |
|                 | 1900          | 3  | 12 | 26 | 44  | 66  | 92  | 122 | 157 | 195 | 236 |
|                 | 2450          | 3  | 10 | 22 | 38  | 59  | 83  | 111 | 143 | 179 | 219 |
|                 | 3600          | 2  | 8  | 18 | 32  | 49  | 71  | 96  | 125 | 158 | 195 |
|                 | 5800          | 1  | 6  | 14 | 25  | 40  | 58  | 80  | 106 | 136 | 169 |

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 300 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

### 3. Evaluation Results

| Mode   | CH   | Peak output Power (dBm) | Antenna Gain (dBi) | effective radiated power (dBm) | Target power (dBm) | Max. Target power (mW) | SAR Test Exemption Limit (mW) |
|--------|------|-------------------------|--------------------|--------------------------------|--------------------|------------------------|-------------------------------|
| BLE 1M | 2402 | 0.42                    | -1.84              | -3.57                          | -3±1               | 0.631                  | 2.72                          |
|        | 2440 | 0.42                    | -1.84              | -3.57                          | -3±1               | 0.631                  | 2.72                          |
|        | 2480 | 0.73                    | -1.84              | -3.26                          | -3±1               | 0.631                  | 2.72                          |
| BLE 2M | 2402 | 0.63                    | -1.84              | -3.36                          | -3±1               | 0.631                  | 2.72                          |
|        | 2440 | 0.48                    | -1.84              | -3.51                          | -3±1               | 0.631                  | 2.72                          |
|        | 2480 | 0.83                    | -1.84              | -3.16                          | -3±1               | 0.631                  | 2.72                          |

#### For 2.4G SRD

Field strength =73.81dBuV/m@3m

$$P = \{ [10^{(73.81/20)} / 10^6 * 3]^2 / 30 \} * 1000 \text{mW} = 0.0072 \text{mW} < 2.72 \text{mW}$$

Note:

1. Limited =  $3060 * (0.5/20)^x$ ,  $x = -\log(60/(3060 * \sqrt{f}))$ .
2. We choose  $f = 2.48 \text{GHz}$  (Highest frequency operate at bluetooth) to calculate MPE limit as higher frequency will have lower MPE limits.
3. SAR Test Exclusion Thresholds is 2.72mW for separation distance 5mm. Therefore, SAR test is not required.

**End of Test Report**