



RF EXPOSURE EVALUATION

Report No. : AB0046722(0) Date: 31 Aug 2022

Application No. : LB026967(8)

Applicant : Gatekeeper Systems (HK) Ltd.
36/F, Tower 2, Times Square 1 Matheson Street, Causeway Bay,
Hong Kong

Sample Description : One(1) item of submitted sample stated to be

Product Description : Remote Controlled Locking Wheel
Radio Frequency : 2403 – 2478MHz (MSK)
: 2402 – 2452MHz (FSK)
Supply voltage : DC3V battery

No. of submitted sample : 1

FCC ID : W3Z-W9470B

Date Received : 11 Aug 2022

Evaluation Period : 11 Aug 2022 to 19 Aug 2022

Evaluation Method : 447498 D04 Interim General RF Exposure Guidance v01 - RF Exposure Procedure
and Equipment Authorization Policies for Mobile and Portable Devices

Conclusion : The source-based time-averaged maximum power was satisfied RF exposure
requirements.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Wong Lap Pong / Andrew
Deputy Technical Manager

Page 1 of 4

Document name: FCC RF exposure - Document Ref No: RT-EL-EMC-008 - Issue Date: 01 Dec 2017 - Edition: 1

The conformity statement stated in Conclusion above is based on the decision rule agreed with applicant and listed in www.cmateesting.org/qac/statement-of-conformity.pdf.
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Simultaneous power

No Simultaneous transmission

RF Exposure Evaluation

According to KDB 447498 D04 clause 2.1.2, if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions.

Result

1.
 - Frequency : 2.402 – 2.452GHz (FSK)
 - Max. peak output power, including tune-up tolerance : 0.479mW
 - Minimum test separation distances : <5mm

Under FSK modulation, the maximum peak output power is lower than 1mW. It is meet the blanket exemption under 1.1307(b)(3)(i)(A)

2.
 - Frequency : 2.403 – 2.478GHz (MSK)
 - Max. peak output power, including tune-up tolerance : 1.122mW
 - Minimum test separation distances : <5mm

Under MSK modulation, the maximum peak output power is greater than 1mW and further evaluation is needed.

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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 case, 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 ≤ 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.



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Field strength = 95.7dBuV/m@3m

$P = \{ [10(95.7/20) / 10^6 * 3]^2 / 30 \} * 1000\text{mW} = 1.115\text{mW} < 2.72\text{mW}$

Note:

1. Limited = $3060 * (0.5/20)^x$, $x = -\log(60 / (3060 * \sqrt{f}))$.
2. Choosing $f = 2.48\text{GHz}$ (Highest frequency operate) 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

Conclusion

The corresponding SAR test exclusion threshold was satisfied 2.1.2 requirements for FSK and was satisfied 2.1.3 requirements for MSK. Further measurement is not required.

***** End of Evaluation *****