



RF EXPOSURE EXEMPT REPORT

APPLICANT : Qingdao Magene Intelligence
Technology Co., Ltd.

PRODUCT NAME : Smart GPS Bike Computer

MODEL NAME : C406 Pro

BRAND NAME : Magene

FCC ID : 2ALZG-C406PRO

STANDARD(S) : FCC 47CFR Part 2(2.1093)

RECEIPT DATE : 2021-11-09

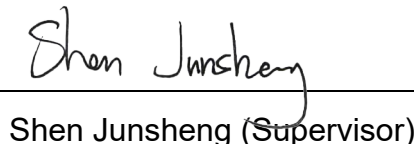
TEST DATE : 2021-11-12 to 2021-11-25

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Change History		
Version	Date	Reason for change
1.0	2022-04-11	First edition



1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Qingdao Magene Intelligence Technology Co., Ltd.
Applicant Address:	Room 302, Building 3, No.328A Chengkang Road, Xiazhuang Subdistrict, Chengyang District, Qingdao, Shandong, China
Manufacturer:	Qingdao Magene Intelligence Technology Co., Ltd.
Manufacturer Address:	Room 302, Building 3, No.328A Chengkang Road, Xiazhuang Subdistrict, Chengyang District, Qingdao, Shandong, China

1.2 Equipment Under Test (EUT) Description

Product Name:	Smart GPS Bike Computer
Sample No.:	10#, 29#
Hardware Version:	1.0
Software Version:	1.0
Operating Frequency Range:	Bluetooth: 2402MHz-2480MHz ANT+: 2457MHz
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	-2.0dBi

Note 1: According to the certificate holder, they declared that the product C406 Pro has two suppliers' LCD screen and three suppliers' Flash. LCD screen and Flash only different in supplier. Two supplier's LCD and three supplier's Flash can be used in any combination.

Main Supply

Part Name	Model	Supplier
LCD screen	GY128160-06	Shen Zhen Genyu Optical Co., Ltd.
Flash	MX25L25645GZ2I-08G	Macronix International Co., Ltd

Secondary Supply

Part Name	Model	Supplier
LCD screen	BTG-128160H-FBWB-G-G-A	YEEBO DISPLAY LTD
Flash	GD25Q256EYIG	GigaDevice



Third Supply

Part Name	Model	Supplier
Flash	MX25L25645GZ2I-10G	Macronix International Co., Ltd

Their electrical circuit design, layout and internal wiring are identical. The changes do not affect the results in report.

1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method Determination /Remark
FCC 47CFR Part 2(2.1093)	Radio Frequency Radiation Exposure Assessment: Portable devices	No deviation
KDB 447498 D04v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices	No deviation

Note 1: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 2: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



2. Device Category and RF Exposure Limit

Based on 47CFR 2.1093, this device belongs to portable device category with General Population/Uncontrolled exposure.

Portable Devices:

47CFR 2.1093(b)

For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

General Population/Uncontrolled Exposure:

47CFR 2.1093(d) (2)

Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.



3. RF Output Power

<Bluetooth Output Power>

Mode	Channel	Frequency (MHz)	Average Power (dBm)
			GFSK
BLE 1Mbps	CH 00	2402	-1.74
	CH 19	2440	-1.68
	CH 39	2480	-1.66
BLE 2Mbps	CH 00	2402	-1.77
	CH 19	2440	-1.68
	CH 39	2480	-1.88
Tune-up Limit			-1.00

Frequency (MHz)	Average Power (dBm)
2457	-2.06
Tune-up Limit	-1.50

Note 1: According to KDB 447498 Section 4.3, SAR test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Note 2: The output power refers to report (Report No.: SZ21100120W01/W02).

4. RF Exposure Assessment

➤ Standalone Transmission SAR Assessment

1. According to KDB 447498 D04v01 Appendix B, the 1-g SAR test exclusion thresholds at test separation Distances ≤ 20 mm are determined by:

- a. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator. For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

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

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

- b. The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

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

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.



2. When the device is used, 5mm as the most conservative minimum test separation distance was used for evaluating.

Channel	Frequency (GHz)	Separation Distance (cm)	ERP _{20cm}	P _{th} (mW)
CH 39	2.480	0.5	3060	10
-	2.457	0.5	3060	10

3. When standalone SAR is not required to be measured, per FCC KDB 447498 D04v01 Appendix E, the following equation must be used to estimate the standalone 1g SAR.

$$SAR_{est} = 1.6 \cdot P_{ant} / P_{th} \quad [W/kg]$$

$P_{ant} < P_{th}$, where P_{ant} is maximum time-averaged power or effective radiated power (ERP)

Mode	Max. Tune-up Power (dBm)	Exposure Position	Body
		Test Distance (cm)	0.5
Bluetooth	-1.00	Estimated SAR (W/kg)	0.59
ANT ⁺	-1.50	Estimated SAR (W/kg)	0.58

➤ **Simultaneous SAR Assessment:**

Simultaneous Transmission Consideration	Position	Applicable Combination
	Body	Bluetooth & ANT+

Transmission Bands	Bluetooth SAR (W/kg)	ANT ⁺ SAR (W/kg)	Simultaneous Transmission SAR (W/kg)
Bluetooth & ANT+	0.59	0.58	1.17



Annex A Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

————— END OF REPORT —————