RF Exposure evaluation

Product Name	:	Smart lever lock with fingerprint
Brand Name	:	N/A
Model	:	P03-205A
Series Model	:	See page 6
FCC ID	:	2A97U-P
Applicant	:	**Zhongshan Meta Intelligence Technology Co., Ltd.**
Address	:	No. 18, Yonghui Road, Nantou Town, Zhongshan, Guangdong, China
Manufacturer	:	**Zhongshan Meta Intelligence Technology Co., Ltd.**
Address	:	No. 18, Yonghui Road, Nantou Town, Zhongshan, Guangdong, China
Standard(s)	:	47CFR §1.1310, 47CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt	:	Apr. 03, 2025
Date of Test	:	Apr. 03, 2025~ Apr. 19, 2025
Issued Date	:	Apr. 19, 2025

Issued By: **Guangdong Asia Hongke Test Technology Limited**
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

Reviewed by: Leon Yi
Leon.yi

Approved by: Sean She
Sean She

Report Revise Record

Report Version	Issued Date	Notes
M1	Apr. 19, 2025	Initial Release

Contents

1 GENERAL INFORMATION

1.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

1.2 General Description of EUT

Product Name:	Smart lever lock with fingerprint
Model/Type reference:	P03-205A
Serial Model:	P01-20, P01-K1, P01mini-20, P01mini-K1, P01pro-20, P01pro-K1, P01PLUS-20, P01PLUS-K1, P02-20, P02-K1, P02mini-20, P02mini-K1, P02pro-20, P02pro-K1, P02PLUS-20, P02PLUS-K1, P03-20, P03-K1, P03mini-20, P03mini-K1, P03pro-20, P03pro-K1, P03PLUS-20, P03PLUS-K1, P04-20, P04-K1, P04mini-20, P04mini-K1, P04pro-20, P04pro-K1, P04PLUS-20, P04PLUS-K1, P05-20, P05-K1, P05mini-20, P05mini-K1, P05pro-20, P05pro-K1, P05PLUS-20, P05PLUS-K1
Different modes:	All models are same as the samples except model name and appearance color, they have the same structure and circuit.
Power Rating:	DC 6.0V from battery or DC 5V from external circuit
Hardware Version:	N/A
Software Version:	N/A
Sample(s) Status:	AiTSZ-250403006 -1(Normal sample) AiTSZ-250403006 -2(Engineer sample)
Bluetooth :	
Supported type:	Bluetooth BLE 1M
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	79
Channel separation:	2MHz
Antenna type:	Ceramic antenna
Antenna gain:	3.0dBi
NFC:	
Operation frequency:	13.56MHz
Modulation :	ASK
No. of Channel :	1
Antenna type:	Loop antenna
Remark: The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.	

1.3 Test Facility

Test Laboratory:
Guangdong Asia Hongke Test Technology Limited
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:
FCC-Registration No.: 251906 Designation Number: CN1376
Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165
The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01
Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Guangdong Asia Hongke Test Technology Limited’s quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	9KHz~30MHz ±1.20 dB	(1)
Radiated Emission	9KHz~30MHz ±3.10dB	(1)
Radiated Emission	30MHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88 dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)
RF power, conducted	30MHz~6GHz ±0.16dB	(1)
RF power density, conducted	±0.24dB	(1)
Spurious emissions, conducted	±0.21dB	(1)
Temperature	±1℃	(1)
Humidity	±3%	(1)
DC and low frequency voltages	±1.5%	(1)
Time	±2%	(1)
Duty cycle	±2%	(1)
Bandwidth	$\pm 1.5 \times 10^{-6}$	(1)

The report uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

2 Method of measurement

2.1 Applicable Standard

According to §1.1307(b)(1), 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 of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures

2.2 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/Controlled 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

2.3 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

2.4 Antenna Information

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

Antenna	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
BLE	/	Ceramic antenna	3.0dBi	2400-2500MHz
NFC	/	Loop antenna	0 dBi	13.553-13.567MHz

2.5 Manufacturing Tolerance

Frequency (MHz)	BLE(Peak)		
	2402	2440	2480
Target (dBm)	-4.0	-4.0	-4.0
Tolerance ± (dB)	± 1	± 1	± 1

NFC(dBμV/m)	
Frequency (MHz)	dBμV/m
13.56	63.81

2.6 Standalone MPE Result

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 is refer to section 4, the RF power density can be obtained.

For BLE:

Modulation Type	Output power with tune_up		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
2.4G BLE	-3.0	0.5012	3.0	1.9953	0.0002	1

For NFC:

Modulation Type	Field strength (dBuV/m)	EIRP		MPE (mW/cm2)	MPE Limits (mW/cm2)
		dBm	mW		
NFC 13.56MHz	63.81	-31.45	0.0007	0.0000001	0.9789

Note:

E = EIRP – 20log D + 104.8

where:

E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

EIRP=E-104.8+20logD, D=3

Remark:

1. Output power (Peak) including turn-up tolerance;

2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

The EUT integral two transmitter, and can transmit simultaneously, according to KDB447498 if the sum of the MPE Ratio for All Antennas ≤1.0, the evaluation of simultaneously transmit can be exempt.

SUM MPE_{Ratios} =BLE_{Ratio} + NFC_{Ratio} = 0.0002/1+ 0.0000001/0.9789= 0.0002001 < 1.0

Note: MPE Ratios are Calculated as [(MPE1/Limit)+(MPE2/Limit)+...]≤1.0

2.7 Conclusion

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

********** **End of Report** **********