TEST REPORT

Applicant:	shenzhen hongling smartlink Technology Co.,Ltd
Address:	Unit 2001-B1, Building B2, Zone B, Phase I, Baoneng Park (South District), Qinghu Industrial Zone, Gangtou community, Bantian Street, Longgang District, Shenzhen
Equipment Type:	smart lock
Model Name:	Y1 (refer section 2.4)
Brand Name:	Smonet, hornbill, HEANTLE
Test Standard:	FCC 47 CFR Part 2.1093; KDB 447498 D04 v01
Test Date:	Jul. 04, 2022 - Jul. 06, 2022
Date of Issue:	Oct. 10, 2022

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Julie zhu

Checked by: Xiong Lining

Approved by: Wei Yanquan

(Chief Engineer)

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Oct. 10, 2022	Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☑ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	shenzhen hongling smartlink Technology Co.,Ltd
Address	Unit 2001-B1, Building B2, Zone B, Phase I, Baoneng Park (South District), Qinghu Industrial Zone, Gangtou community, Bantian Street, Longgang District, Shenzhen

2.2 Manufacturer Information

Manufacturer	shenzhen hongling smartlink Technology Co.,Ltd
Address	Unit 2001-B1, Building B2, Zone B, Phase I, Baoneng Park (South District), Qinghu Industrial Zone, Gangtou community, Bantian Street, Longgang District, Shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	smart lock
Model Name Under Test	Y1
Series Model Name	Y2, Y3, M1, M2, A1, A2, H1, H2, H3, H4, D2
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in enclosure/ color (this information provided by the customer).
Hardware Version	1.0
Software Version	1.0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Network and Wireless connectivity	Bluetooth BLE, NFC

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth	
Frequency Range	Bluetooth	2400 ~ 2483.5 MHz
	NFC	13.56 MHz
Antenna Type	Bluetooth	PCB
	NFC	PCB
Exposure Category	General Population/Uncontrolled Exposure	
EUT Stage	Fixed Device	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	FCC 47 CFR Part 2.1093;	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 General RF Exposure Guidance D04 v01

4 DEVICE CATEGORY AND LEVELS LIMITS

CFR Title 47 §2.1091(b)
(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v06 Limit

Devices operating in standalone mobile exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When the categorical exclusion provision of § 2.1091(c) applies, the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner the ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

Limits for General Population/ Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength(E)(V/m)	Magnetic Field Strength (H)(A/m)	Power Density (S)(mW/cm^2)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f2)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0

MPE calculation formula

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density

P = output power (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Separation distance between radiator and human body (cm)

5 ASSESSMENT RESULT

5.1 Output Power

Bluetooth			
Mode	GFSK (BLE 1Mbps)		
	Low Channel	Middle Channel	High Channel
Conducted Power (dBm)	-3.12	**-2.94**	-3.73
Antenna Gain (dBi)	2		
EIRP(dBm)	-1.12	-0.94	-1.73
Note: This table listed the worst case power value, please refer to BL-SZ2260819-601 report for more details.			

NFC	
Mode	Low Channel
Radiated Emission (dBuV/m)	53.46
EIRP (dBm)	-31.34
Note: This table listed the worst case power value, please refer to BL-SZ2260819-402 report for more details.	

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	(-4.00) – (-2.00)	(-2.00) - 0	(-4.15) – (-2.15)
NFC	/	(-32.00) - (-31.00)	(-34.15) – (-33.15)
Note1: ERP= EIRP -2.15dB Note2: According KDB 447498 D04, used the greater of maximun conducted power and ERP to compare with the threshold value Pth.			

5.3 Assessment Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Verdict
Bluetooth	-2.00	0.63000	5	2.79	Pass
NFC	-31.34	0.00073	5	1.00	Pass

5.4 Conclusion

This EUT is deemed to comply with the reference level limits by Council Recommendation 1999/519/EC, therefore the basic restrictions are compliant with human exposure limits.

Statement

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