



REPORT No.: SZ24030142S01

RF EXPOSURE EVALUATION REPORT

APPLICANT : PIN GENIE, INC. DBA LOCKLY

PRODUCT NAME : Lockly Visage Zeno Series Deadbolt Edition

MODEL NAME : PGK728WRHK

BRAND NAME : LOCKLY

FCC ID : 2ASIVPGK728WRHK

STANDARD(S) : FCC 47 CFR Part 2(2.1091)

RECEIPT DATE : 2024-05-07

TEST DATE : 2024-05-15 to 2024-05-28

ISSUE DATE : 2024-06-13



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MORLAB

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Change History		
Version	Date	Reason for change
1.0	2024-06-06	First edition
2.0	2024-06-13	Modified the Applicant information and Maximum Field Strength of Radar and replaced the test report version 1.0.



1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	PIN GENIE, INC. DBA LOCKLY
Applicant Address:	676 Transfer Rd., St. Paul, Minnesota, United States, 55114
Manufacturer:	Smart Electronic Industrial (Dongguan) Co., Ltd
Manufacturer Address:	Room 101, 10 Qinglong Road Huangjiang Town, Dongguan, Guangdong, China

1.2 Equipment under Test (EUT) Description

Product Name:	Lockly Visage Zeno Series Deadbolt Edition	
Sample No.:	1#, 2#	
Hardware Version:	00	
Software Version:	V1	
Modulation Technology:	Bluetooth	GFSK
	WLAN 2.4GHz	DSSS, OFDM
	NFC	ASK
Operating Frequency Range:	Bluetooth	2402MHz-2480MHz
	WLAN 2.4GHz	2412MHz-2472MHz
	NFC	13.56MHz
	Radar	10.5GHz-10.55GHz
Antenna Type:	Bluetooth	FPC Antenna
	WLAN 2.4GHz	FPC Antenna
	NFC	Loop Antenna
Antenna Gain:	Bluetooth	1.80dBi
	WLAN 2.4GHz	-0.30dBi

Note 1: When the test result is a critical value, we will use the measurement uncertainty to give the judgment result based on the 95% risk level.



1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method determination /Remark
FCC 47 CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: Mobile devices	No deviation
KDB 447498 D01v06	General RF Exposure Guidance	No deviation
Note: 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.		

2. Device Category and RF Exposure Limit

Per user manual, based on 47 CFR 2.1091, this device belongs to portable device category with General Population/Uncontrolled exposure.

➤ **Mobile Devices:** 47 CFR 2.1091(b)

For purposes of this section, a portable 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 greater than 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location.

➤ **General Population/Uncontrolled Exposure limit:**

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

Table 1 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz* = Plane-wave equivalent power density

3. Maximum Average Power (Strength) Summary

➤ Maximum Average Power

Wireless Mode	Frequency (MHz)	Max. Average Power (dBm)	Tune-up Power (dBm)	Tune-up Power (mW)
Bluetooth	2440	-1.08	-0.50	0.89
WLAN 2.4GHz	2412	17.18	18.50	70.80

Note:

1. According to KDB 447498 Section 4.3, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.
2. The maximum average power of WLAN and Bluetooth derives from the report SZ24030142W01/W02.
3. Limitation expressed in dBm is calculated by $10^{P/10}$ (mW).

➤ Maximum Field Strength of Radar

Wireless Mode	Frequency (GHz)	Peak field strength (dBuV/m)	Peak field strength (V/m)	Peak EIRP (mW)
Radar	10.549	94.309	0.052	0.81

Note:

1. The maximum field strength of radar is derived from the report SZ24030142W03.
2. Limitation expressed in dBuV/m is calculated by $20\log$ Emission Level ($1000 \times \text{mV/m}$) per section 15.245(b).
3. EIRP calculate method

$$\text{EIRP} = (E \cdot d)^2 / 30$$

Where

E is electric field strength in V/m

d is measurement distance in meters (m)

EIRP is the equivalent isotropically radiated power in W

4. RF Exposure Assessment

➤ Standalone Transmission Assessment

Wireless Mode	Frequency (MHz)	Tune-up Limit (dBm)	Antenna Gain (dBi)	E.I.R.P (mW)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
Bluetooth	2440	-0.50	1.80	1.35	<0.001	1.0
WLAN 2.4GHz	2412	18.50	-0.30	66.07	0.013	1.0

<Radar>

Wireless Mode	Frequency (GHz)	Peak EIRP (mW)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
Radar	10.549	0.81	<0.001	1.0

Note:

- For NFC, RF exposure assessment is not required since its averaging time is less or equal than one second.
- According to the unwanted emissions requirements of ANSI C63.10-2013 clause 12.7.3, if radiated measurements are performed, then field strength is then converted to EIRP.
- MPE calculate method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (5mm)

➤ Simultaneous Transmission Assessment

- Multi-band simultaneous transmission consideration

Plot No.	Simultaneous Transmission Consideration	Body
1	Bluetooth + WLAN 2.4GHz + Radar	Yes

- Multi-band simultaneous transmission result

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

- P and ERP summation terms are basic exemption criteria
- Evaluated/Exposure Limit sum accounts for preexisting exposure levels



3. It is only the worst condition would be shown in this report for simultaneous transmission.

Wireless Mode	RF Exposure (mW/cm ²)	MPE Limit (mW/cm ²)	Total Exposure Ratio	TER Limit
Bluetooth	<0.001	1.0	0.013	1.0
WLAN 2.4GHz	0.013	1.0		
Radar	<0.001	1.0		

➤ **Conclusion:**

According to 47 CFR Part 2.1091, this device complies with human exposure basic restrictions.



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

The FCC designation number is CN1192, the test firm registration number is 226174.

_____ END OF REPORT _____