REPORT No.: SZ22060378S01

TEST REPORT

APPLICANT	:	Vaultek Safe, Inc.
PRODUCT NAME	:	Smart Station
MODEL NAME	:	DS2i-BK, DS2i-TG, DS2i-WT, DS2i-SA, DS2i-SB, DS2i-SD, DS2i-SR, DS2i-CN
BRAND NAME	:	Vaultek
FCC ID	:	2AONI-DS2I-8762C460
STANDARD(S)	:	FCC 47 CFR Part 2(2.1091)
RECEIPT DATE	:	2022-07-14
TEST DATE	:	2022-07-27
ISSUE DATE	:	2022-08-17

Edited by: Xie Yiyun

Xie Yiyun (Rapporteur)

Approved by: Shen Junsheng

Shen Junsheng (Supervisor)

MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2022-08-17	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Vaultek Safe, Inc.
Applicant Address:	37 N Orange Ave.Suite 770 Orlando, FL 32801
Manufacturer:	Jeritech Electronics, Ltd.
Manufacturer Address:	Guannanyong Industrial Estate, Shiqi Town, Panyu, GuangZhou, China

1.2. Equipment under Test (EUT) Description

Product Name:	Smart Station
EUT No.:	3#
Hardware Version:	1.0.0
Software Version:	1.0.0
Frequency Bands:	Bluetooth: 2402 MHz ~ 2480 MHz Wireless charging: 110KHz ~ 150KHz
Antenna Type:	PCB Antenna
Antenna Gain:	Bluetooth: 1.34 dBi

1.3. MPE Results Summary

Operation Frequency	**Highest MPE Summary**	
	E-field (V/m)	**H-field (A/m)**
110~ 150 KHz	1.44	0.0695

Note:

1. There are eight models in this report, DS2i-BK, DS2i-TG, DS2i-WT, DS2i-SA, DS2i-SB, DS2i-SD, DS2i-SR and DS2i-CN, both of them are different from model number and colors.
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.

1.4. Photographs of the EUT

Please refer to the External Photos for the Photos of the EUT

1.5. 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 Evaluation: mobile devices	No deviation
KDB 447498 D04v01	General RF Exposure Guidance	No deviation
KDB 680106 D01v03	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications	No deviation
Note 1: The test item is not applicable. **Note 2:** 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 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(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. 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. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

General Population/Uncontrolled Exposure:

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.

Basic Restrictions Reference levels

Basic Restriction for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

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)
(A) 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
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

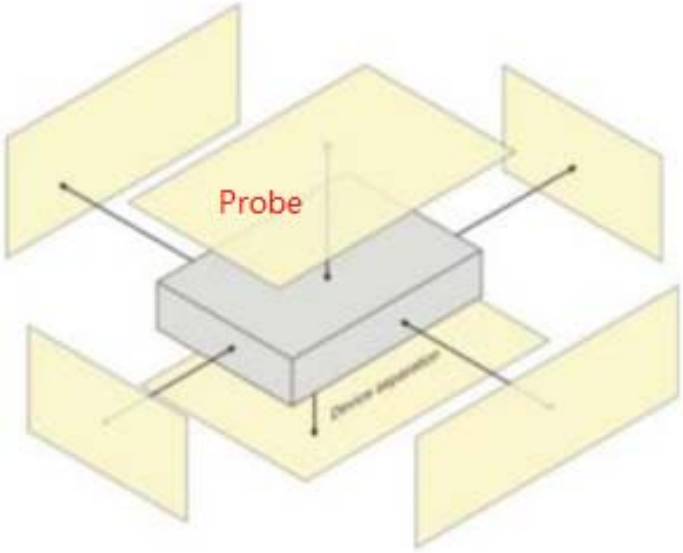
3. General Information for E-Field/H-Field

For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

3.1. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Radiated Frequency	$7*10^{8}$
Uncertainty for test site temperature and humidity	0.6 ℃
	3%

3.2. Test Setup



4. RF Output Power

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	**7.84**	**7.51**
	CH 19	2440	7.81	7.50
	CH 39	2480	7.49	7.21
Tune-up Limit			8.50	8.00

Note: The output power of Bluetooth is derived from the report SZ22060378W01.

5. Assess Results

5.1. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
STT	Broadband Field meter	SEM-600	D-1044	2021.10.28	2024.10.27
STT	Probe	LF-04	I-1044	2021.10.28	2024.10.27
STT	Probe holder	TR-01	N/A	N/A	N/A
STT	Optical fiber line	L=5M	N/A	N/A	N/A

5.2. Test Results for EMF

EUT: Smart Station	Test Date: 2022.07.27
Temperature: 25±2 ℃ Humidity: 20-60%	

➢ **E-Field Strength Result**

E-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**E-field Strength (Max. V/m)**	**Limit 50%(V/m)**	**Verdict**
110KHz ~ 150KHz (5W)	Front Side	20	0.91	307	PASS
	Back Side	15	0.25	307	PASS
	Left Side	15	0.20	307	PASS
	Right Side	15	0.18	307	PASS
	Top Side	15	0.22	307	PASS
	Bottom Side	15	0.25	307	PASS

E-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**E-field Strength (Max. V/m)**	**Limit 50%(V/m)**	**Verdict**
110KHz ~ 150KHz (7.5W)	Front Side	20	1.44	307	PASS
	Back Side	15	0.28	307	PASS
	Left Side	15	0.23	307	PASS
	Right Side	15	0.19	307	PASS
	Top Side	15	0.29	307	PASS
	Bottom Side	15	0.25	307	PASS

E-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**E-field Strength (Max. V/m)**	**Limit 50%(V/m)**	**Verdict**
110KHz ~ 150KHz (10W)	Front Side	20	1.28	307	PASS
	Back Side	15	0.50	307	PASS
	Left Side	15	0.26	307	PASS
	Right Side	15	0.21	307	PASS
	Top Side	15	0.30	307	PASS
	Bottom Side	15	0.39	307	PASS

E-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**E-field Strength (Max. V/m)**	**Limit 50%(V/m)**	**Verdict**
110KHz ~ 150KHz (15W)	Front Side	20	1.40	307	PASS
	Back Side	15	0.56	307	PASS
	Left Side	15	0.29	307	PASS
	Right Side	15	0.23	307	PASS
	Top Side	15	0.39	307	PASS
	Bottom Side	15	0.44	307	PASS

➢ **H-Field Strength Result**

H-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**H-field Strength (Max. A/m)**	**Limit 50%(A/m)**	**Verdict**
110KHz ~ 150KHz (5W)	Front Side	20	0.0362	0.815	PASS
	Back Side	15	0.0117	0.815	PASS
	Left Side	15	0.0127	0.815	PASS
	Right Side	15	0.0153	0.815	PASS
	Top Side	15	0.0018	0.815	PASS
	Bottom Side	15	0.0070	0.815	PASS

H-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**H-field Strength (Max. A/m)**	**Limit 50%(A/m)**	**Verdict**
110KHz ~ 150KHz (7.5W)	Front Side	20	0.0416	0.815	PASS
	Back Side	15	0.0118	0.815	PASS
	Left Side	15	0.0122	0.815	PASS
	Right Side	15	0.0188	0.815	PASS
	Top Side	15	0.0141	0.815	PASS
	Bottom Side	15	0.0094	0.815	PASS

H-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**H-field Strength (Max. A/m)**	**Limit 50%(A/m)**	**Verdict**
110KHz ~ 150KHz (10W)	Front Side	20	0.0562	0.815	PASS
	Back Side	15	0.0137	0.815	PASS
	Left Side	15	0.0136	0.815	PASS
	Right Side	15	0.0148	0.815	PASS
	Top Side	15	0.0650	0.815	PASS
	Bottom Side	15	0.0810	0.815	PASS

H-field strength result (Test frequency range from 110KHz to 150KHz)					
Test Loading	**Exposure Position**	**Distance (cm)**	**H-field Strength (Max. A/m)**	**Limit 50%(A/m)**	**Verdict**
110KHz ~ 150KHz (15W)	Front Side	20	0.0695	0.815	PASS
	Back Side	15	0.0153	0.815	PASS
	Left Side	15	0.0181	0.815	PASS
	Right Side	15	0.0241	0.815	PASS
	Top Side	15	0.0134	0.815	PASS
	Bottom Side	15	0.0085	0.815	PASS

Note：

1. According to the user manual, output power from each primary coil is less than or equal to 15 watts.
2. According to KDB 680106 D01V03 section 5 b), the aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit
3. This device designed for typical desktop applications, therefore mobile exposure conditions are applied and client device is placed directly in contact with the transmitter.
4. The EUT test photos, please see the Annex B.

5.3. RF Exposure Assessment for Bluetooth

➢ **Standalone Transmission Assessment:**

Bands	Frequency (MHz)	Tune-up Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	PD (mW/cm²)	Limit Value (mW/cm²)
Bluetooth	2402	8.5	1.34	9.64	0.002	1.0

Note:

1. According to KDB 447498, SAR test exclusion conditions are 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. MPE calculate method

$$S = PG/4\pi R^2$$

Where: S= Power density (in appropriate units, e.g. mW/cm^2)

P = Time-average maximum tune-up power (in appropriate units, e.g. dBm)

G = numeric gain of the antenna (in appropriate units, e.g. dBi)

R = Separation distance to the centre of radiation of the antenna (20cm)

5.4. Simultaneous Transmission Analysis

➢ **Simultaneous Transmission Consideration**

Simultaneous Transmission Consideration	Position	Applicable Combination
	Body	E-Field/H-Field + Bluetooth

Total Exposure Radio Analysis

The fields generated by the antennas can be correlated or uncorrelated. At different frequencies, fields are always uncorrelated, and the aggregate power density contributions can be summed according to spatially averaged values of corresponding sources at any point in space, r, to determine the total exposure ratio (TER). Assuming I sources, the TER at each point in space is equal to

$$TER^{uncorr}(r) = \sum_{i=1}^{I} ER_i = \sum_{i=1}^{I} \frac{S_{av,i}(r, f_i)}{S_{lim}(f_i)}$$

Where Sav,i is the power density for the source I operating at a frequency fi and Slim is the power density limit as specified by the relevant standard.

Exposure from transmitters operating below 6GHz, where 6GHz denotes the transmission frequency where the basic restrictions change from being defined in terms of SAR to being defined in terms of power density, therefore uncorrelated and the TER is determined as

$$TER^{uncorr}(r) = \sum_{i=1}^{I} ER_i = \sum_{i=1}^{I} \frac{S_{av,i}(r, f_i)}{S_{lim}(f_i)}$$

➢ **Simultaneous Transmission Analysis**

The worst case of the E-Field/H-Field + Bluetooth mode will be calculated for transmitting simultaneously.

$$TER = \sum_{i=1}^{400kHz} \frac{Ei/Hi}{MPEi} + \sum_{i=1}^{300GHz} \frac{Si}{Slimit} < 1$$

Body	1	2	3	1+2	1+3
	E-Field (V/m)	H-Field (A/m)	Bluetooth (mW/cm²)	TER	TER
RF Exposure	1.44	0.0695	0.002	0.007	0.087
Limit to Ratio	307	0.815	1.0		

➢ **Conclusion:**

According to 47 CFR §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.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

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

Note：

The main report is end here and the other Annex B will be submitted separately.

****** END OF REPORT ******