



REPORT No.: SZ20010113S01

# RFEXPOSURE EVALUATIONREPORT

**APPLICANT** : Shenzhen Xhorse Electronics Co., Ltd.

**PRODUCT NAME** : MINI OBD TOOL

**MODEL NAME** : XDMO

**BRAND NAME** : Xhorse

**FCC ID** : 2A14T-XDMO00

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

**RECEIPT DATE** : 2020-01-13

**TEST DATE** : 2020-04-16 to 2020-05-29

**ISSUE DATE** : 2021-04-29

Edited by: Chen Bilian  
Chen Bilian (Rapporteur)

Approved by: Peng Huarui  
Peng Huarui (Supervisor)

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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  
Http://www.morlab.cn

Fax: 86-755-36698525  
E-mail: service@morlab.cn





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Change History		
Version	Date	Reason for Change
1.0	2021-04-29	First edition



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1 Applicant and Manufacturer Information

<b>Applicant:</b>	Shenzhen Xhorse Electronics Co., Ltd.
<b>Applicant Address:</b>	Floor 28, Block A, Building NO.6, international innovation Valley, Nanshan District, Shenzhen, China
<b>Manufacturer:</b>	Shenzhen Xhorse Electronics Co., Ltd.
<b>Manufacturer Address:</b>	Floor 28, Block A, Building NO.6, international innovation Valley, Nanshan District, Shenzhen, China

## 1.2 Equipment Under Test (EUT) Description

<b>Product Name:</b>	MINI OBD TOOL
<b>Serial No.:</b>	(N/A, marked #1 by test site)
<b>Hardware Version:</b>	V1.2
<b>Software Version:</b>	V1.1.0
<b>Frequency Bands:</b>	WLAN 2.4GHz: 2412 MHz ~2467 MHz Bluetooth: 2402 MHz ~ 2480 MHz
<b>Modulation Mode:</b>	802.11b: DSSS 802.11g/n-HT20/HT40: OFDM Bluetooth LE: GFSK Bluetooth classic: FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK)
<b>Antenna Type:</b>	PCB Antenna
<b>Antenna Gain:</b>	1dBi

**Note 1:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



## 1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method Determination /Remark
FCC 47CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: mobile devices	No deviation
KDB 447498 D01v06	General RF Exposure Guidance	No deviation
<p><b>Note 1:</b> 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.</p> <p><b>Note 2:</b> When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% risk level.</p>		



## 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.

**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 <sup>2</sup> )	Averaging Time (minutes)
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

### 3. RF Output Power

#### <WLAN 2.4GHz>

	Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-up Power	Duty Cycle %
WLAN 2.4GHz	802.11b 1Mbps	CH 1	2412	<b>13.44</b>	14.00	100.00
		CH 7	2442	13.41	14.00	
		CH 12	2467	13.40	14.00	
	802.11g 6Mbps	CH 1	2412	12.30	13.00	100.00
		CH 7	2442	12.21	13.00	
		CH 12	2467	12.32	13.00	
	802.11n-HT20 MCS0	CH 1	2412	12.12	13.00	100.00
		CH 7	2442	12.21	13.00	
		CH 12	2467	12.24	13.00	
	802.11n-HT40 MCS0	CH 3	2422	12.34	13.00	100.00
		CH 7	2442	12.40	13.00	
		CH 11	2462	12.08	13.00	

#### <Bluetooth>

Mode	Channel	Frequency (MHz)	Average Power (dBm)
			GFSK
Bluetooth LE	CH 00	2402	-1.18
	CH 19	2440	-1.06
	CH 39	2480	-1.45
Tune-up Limit			-1.00

Mode	Channel	Frequency (MHz)	Average Power (dBm)		
			1Mbps	2Mbps	3Mbps
Bluetooth Classic	CH 00	2402	8.77	7.75	7.86
	CH 39	2441	<b>8.82</b>	7.82	8.20
	CH 78	2480	8.08	7.74	7.74
Tune-up Limit			9.00	9.00	9.00

**Note 1:** The output power refers to report (Report No.: SZ20010113W01/W02/W03).

## 4. RF Exposure Evaluation

### ➤ Standalone Transmission Evaluation:

Bands	Frequency (MHz)	Maximum Tune-up Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power Density (mW/cm <sup>2</sup> )	Limit for MPE (mW/cm <sup>2</sup> )
WLAN 2.4GHz	2412	14.00	1	31.62	0.006	1.0
Bluetooth	2441	9.00	1	10.00	0.002	1.0

### Note:

1. The WLAN 2.4G and Bluetooth transmitter share the same antenna, therefore simultaneous transmission assessment is not required.
2. For 2.4GHz WLAN, only the worst case was used for calculating the power density.
3. 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 (20cm)

### ➤ Simultaneous Transmission Evaluation:

The WLAN 2.4G and Bluetooth transmitter share the same antenna, therefore simultaneous transmission assessment is not required.

### ➤ 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

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

### 2. Identification of the Responsible Testing Location

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

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