

RF Exposure Evaluation
For
Shenzhen Xtooltech Intelligent Co., Ltd.
Wireless Diagnostics Module, Vehicle Communication Interface
Test Model: V220
Additional Model No.: XPortal

Prepared for	:	Shenzhen Xtooltech Intelligent Co., Ltd.
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Prepared by	:	Guangzhou LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	August 05, 2025
Number of tested samples	:	2
Sample No.	:	C250728002-1, C250728002-2
Serial number	:	Prototype
Date of Test	:	August 05, 2025 ~ August 15, 2025
Date of Report	:	August 18, 2025

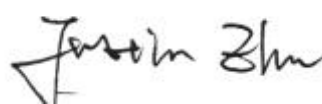
RF Exposure Evaluation	
Report Reference No.	LCSC06105019EB
Date of Issue	August 18, 2025
Testing Laboratory Name	Guangzhou LCS Compliance Testing Laboratory Ltd.
Address	No.44-1, Qianfeng North Road, Shiqi, Panyu District, Guangzhou, Guangdong, China
Testing Location/ Procedure	Full application of Harmonised standards ☒ Partial application of Harmonised standards ☐ Other standard testing method ☐
Applicant's Name	Shenzhen Xtooltech Intelligent Co., Ltd.
Address	17&18/F, A2 Building, Creative City, Liuxian Avenue, Nanshan District, Shenzhen, China
Test Specification	
Standard	FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06 FCC CFR 47 part1 1.1310 FCC CFR 47 part2 2.1091
Test Report Form No.	TRF-4-E-214 A/0
TRF Originator	Guangzhou LCS Compliance Testing Laboratory Ltd.
Master TRF	Dated 2011-03
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EUT Description	Wireless Diagnostics Module,Vehicle Communication Interface
Trade Mark	XTOOL
Test Model	V220
Ratings	Input: DC 9-36V
Result	PASS

Compiled by:



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Justin Zhu/ Technique Director

Approved by:



Gavin Liang/ Manager

RF Exposure Evaluation

Test Report No. :	LCSC06105019EB	<u>August 18, 2025</u> Date of issue
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EUT.....	: Wireless Diagnostics Module,Vehicle Communication Interface
Test Model.....	: V220
Applicant.....	: Shenzhen Xtooltech Intelligent Co., Ltd.
Address.....	: 17&18/F, A2 Building, Creative City, Liuxian Avenue, Nanshan District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Shenzhen Xtooltech Intelligent Co., Ltd.
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Telephone.....	: /
Fax.....	: /
Factory.....	: Bao'an Branch of Shenzhen Xtooltech Intelligent Co., Ltd.
Address.....	: 2,3,4/F, Building 12, Tangtou Third Industrial Zone, Shiyan street, Bao'an District, Shenzhen, China
Telephone.....	: /
Fax.....	: /

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	August 18, 2025	Initial Issue	---

TABLE OF CONTENTS

Description	Page
1. PRODUCT INFORMATION	6
2. EVALUATION METHOD	7
3. LIMIT	7
4. MPE CALCULATION METHOD	8
5. ANTENNA INFORMATION	8
6. CONDUCTED POWER	8
7. MANUFACTURING TOLERANCE	9
8. MEASUREMENT RESULTS	9
9. CONCLUSION	10
10. DESCRIPTION OF TEST FACILITY	10
11. MEASUREMENT UNCERTAINTY	10

1. Product Information

EUT	:	Wireless Diagnostics Module,Vehicle Communication Interface
Test Model	:	V220
Additional Model No.	:	XPortal
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	:	Input: DC 9-36V
Hardware Version	:	V1.1
Software Version	:	/
WIFI(2.4G Band)		
Frequency Range	:	2412MHz~2462MHz
Channel Spacing	:	5MHz
Channel Number	:	11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	Internal Antenna, 2.59dBi(Max.)
Exposure category	:	General population/uncontrolled environment
EUT Type	:	Production Unit
Device Type	:	Mobile Devices

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR 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.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3.1 Refer Evaluation Method

[ANSI C95.1-2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz

[FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices.

3.2 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/Uncontrolled 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

4. 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

5. Antenna Information

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

Internal/External Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain	Notes
Internal	Internal Antenna	2400-6000MHz	2.59dBi	WIFI Antenna

6. Conducted Power

[2.4G WIFI]

Mode	Channel	Frequency(MHz)	Max Conducted Power (dBm)
IEEE 802.11b	1	2412	14.83
	6	2437	14.19
	11	2462	14.29
IEEE 802.11g	1	2412	14.21
	6	2437	14.65
	11	2462	14.74
IEEE 802.11n HT20	1	2412	13.74
	6	2437	13.90
	11	2462	13.08
IEEE 802.11n HT40	3	2412	13.31
	6	2437	13.27
	9	2462	13.08

7. Manufacturing Tolerance

[2.4G WIFI]

11B (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11G (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11N20SISO (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	13.0	13.0	13.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
11N40SISO (Peak)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	13.0	13.0	13.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

8. Measurement Results

8.1 Standalone MPE Evaluation

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, $r=20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[2.4G WIFI]

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11b	15.0	31.6228	2.59	1.8155	0.0114	1.0000
IEEE 802.11g	15.0	31.6228	2.59	1.8155	0.0114	1.0000
IEEE 802.11n HT20	14.0	25.1189	2.59	1.8155	0.0091	1.0000
IEEE 802.11n HT40	14.0	25.1189	2.59	1.8155	0.0091	1.0000

Remark:

1. Output power including tune-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.

8.2 Simultaneous Transmission MPE Evaluation

The EUT equipped with one antenna. So no need consider simultaneous transmission.

9. Conclusion

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

10. Description of Test Facility

Site Description

EMC Lab. : CNAS Registration Number is L11555
A2LA Certificate Number: 5099.01
FCC Designation Number is CN1379
Test Firm Registration Number: 729882

11.Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Output power	:	1GHz-40GHz	$\pm 0.57\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

-----THE END OF REPORT-----