

Prüfbericht-Nr.: <i>Test report no.:</i>	CN247FS1 004	Auftrags-Nr.: <i>Order no.:</i>	168513747 Seite 1 von 10 Page 1 of 10
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-11-14
Auftraggeber: <i>Client:</i>	Shenzhen Aiper Intelligent Co., Ltd. Units 3201, 3203A and 3205, 32nd Floor, Block C, Phase 2 Galaxy World, Minle Community, Minzhi Street, Longhua District, Shenzhen, Guangdong, China		
Prüfgegenstand: <i>Test item:</i>	CORDLESS ROBOTIC POOL CLEANER		
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PRX9		
Auftrags-Inhalt: <i>Order content:</i>	Test Report		
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 2: Section 2.1091 RSS-102 Issue 6 December 2023		
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-11-20	Please refer to Photo Document	
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003867017-001~006 A003872682-001~006 A003876839-001~004, EMC-001		
Prüfzeitraum: <i>Testing period:</i>	2024-12-04 - 2024-12-16		
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.		
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.		
Prüfergebnis*: <i>Test result*:</i>	Pass		
geprüft von: <i>tested by:</i>	☒ <u>Breeze Jiang</u>	genehmigt von: <i>authorized by:</i>	☒ <u>Bell Hu</u>
Datum: <i>Date:</i> 2025-03-18	Signed by: Breeze Jiang	Ausstellungsdatum: <i>Issue date:</i> 2025-03-18	Signed by: Bell Hu
Stellung / Position:	Sachverständige(r)/Expert	Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / <i>Other:</i>	FCC ID: 2BMDV-PRX9 IC: 31793-PRX9, HVIN: PRX9		
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>			

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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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Test Summary

3.1.1 RF EXPOSURE COMPLIANCE
RESULT: Pass

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1. Test Sites

1.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Registration No.: CN1260

ISED wireless device testing laboratory: 25069

1.2 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.3 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

1.4 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendixes of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

1.5 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2. General Product Information

2.1 General Description

The EUT is a CORDLESS ROBOTIC POOL CLEANER which supports Bluetooth dual mode, 2.4GHz Wi-Fi and 2.4GHz wireless technologies.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 Rating and System details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	CORDLESS ROBOTIC POOL CLEANER
Type Designation:	PRX9
FCC ID:	2BMDV-PRX9
IC:	31793-PRX9
HVIN:	PRX9
Operating Voltage:	DC 29.4V input via Charging dock DC 25.2V input via internal rechargeable Li-ion battery
Testing Voltage:	AC 120V, 60Hz or Fully charged battery
Operating Temperature Range:	0 °C ~ +40 °C
Technical Specification of Bluetooth (dual mode)	
Operating Frequency:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Channel Number:	BR & EDR mode:79 channels, Low Energy mode:40 channels
Channel Separation:	BR & EDR mode:1MHz, Low Energy mode:2MHz
Data Rate:	BR & EDR mode: 1Mbps, 2Mbps, 3Mbps Low Energy mode: 1Mbps
Antenna Type:	External glue stick antenna
Antenna Gain:	-1.09 dBi (Provided by the Client)
Technical Specification of 2.4GHz Wi-Fi	
Operating Frequency:	2412 - 2462MHz for 802.11b/g/n(HT20)
Type of Modulation:	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
Channel Number:	11 channels for 802.11b/g/n(HT20)
Channel Separation:	5 MHz
Antenna Type:	External glue stick antenna
Antenna Gain:	-1.09 dBi (Provided by the Client)
Technical Specification of 2.4GHz SRD	
Frequency Band:	2400 - 2483.5 MHz

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Operation Frequency:	2478 MHz
Type of Modulation:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	-1.12 dBi (Provided by the Client)

3. Test Results

3.1 RF Exposure Evaluation

3.1.1 RF Exposure Compliance

RESULT:
Pass

Test standard : 47 CFR FCC Part 2.1091
RSS-102 Issue 6 December 2023

Limit : Table 1 of 47 CFR FCC Part 1.1310
Section 6.6 of RSS-102 Issue 6
KDB447498 D01 V06

This device is mobile device, and the applicant declares that the minimum separation distance is greater than 20cm. Therefore, MPE measurement or computational modelling should be used to determine compliance.

Antenna Gain: -1.09 dBi for Bluetooth & 2.4GHz Wi-Fi, -1.12dBi for 2.4GHz.

3.1.1.1 RF Exposure Compliance Requirement for FCC

a) Radio Frequency Exposure Limit

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)
300-1,500	--	--	f/1500
1,500-100,000	--	--	1.0

b) Radio Frequency Exposure Calculation Formula

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

where: S = power density (in appropriate units, e.g. mW/cm²)
P = power input to the antenna (in appropriate units, e.g., mW)
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 (appropriate units, e.g., cm)

or:

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

where: EIRP = equivalent (or effective) isotropically radiated power

c) RF Exposure Calculations for FCC, stand-alone mode

Operating Mode	Measured RF Output Power (dBm)	Max. EIRP (dBm)	Distance (cm)	MPE P_d (mW/cm ²)	Limit (mW/cm ²)	Verdict
Bluetooth	5.81	4.72	20	0.00059	1.0	Pass
2.4GHz Wi-Fi	21.47	20.38	20	0.02171	1.0	Pass
2.4GHz	-14.87	-15.99	20	0.00001	1.0	Pass

Note1: The 2.4GHz Wi-Fi and Bluetooth cannot transmit simultaneously because they share the same antennas.

Note2: RF Output Power of Bluetooth, 2.4GHz Wi-Fi and 2.4GHz refer to report CN247FS1 001, CN247FS1 002 and CN247FS1 003.

d) Simultaneous transmission MPE

Per KDB 447498 D01 v06, 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 calculated or measured field strengths or power density, is ≤ 1.0 .

The product has multiple transmitters, the Simultaneous Transmission possibilities are listing below:

No.	Simultaneous Transmission Scenarios
1	2.4GHz + Bluetooth
2	2.4GHz + 2.4GHz Wi-Fi

No.	Operating Mode	Calculation (mW/cm ²)	Limit (mW/cm ²)	Calculation	Limit	Verdict
1	2.4GHz SRD	0.00001	1.0	0.0006	1	Pass
	Bluetooth	0.00059	1.0			
2	2.4GHz SRD	0.00001	1.0	0.02172	1	Pass
	2.4GHz Wi-Fi	0.02171	1.0			

As the sum of MPE ratios for all simultaneous transmitting antennas is ≤ 1.0 , simultaneous transmission MPE test exclusion will be applied.

e) Conclusion

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.

3.1.1.2 RSS-102 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

The EUT shall comply with the requirement of RSS-102 section 6.6.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

a) RF Exposure Calculations for ISSED, Stand-alone mode

Operating Mode	Maximum EIRP (dBm)	Maximum EIRP (W)	Distance (cm)	Threshold power (W)	Verdict
Bluetooth	4.72	0.00296	20	2.68	Pass
2.4GHz Wi-Fi	20.38	0.1091	20	2.68	Pass
2.4GHz SRD	-15.99	0.00003	20	2.68	Pass

Note: RF Output Power of Bluetooth, 2.4GHz Wi-Fi and 2.4GHz refer to report CN247FS1 001, CN247FS1 002 and CN247FS1 003.

Both e.i.r.p. for Bluetooth & Wi-Fi & 2.4GHz are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

b) Conclusion

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."