

Prüfbericht-Nr.: Test report no.:	CN24CQ8J 002	Auftrags-Nr.: Order no.:	168457207	Seite 1 von 8 Page 1 of 8
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2023-12-14	
Auftraggeber: Client:	Shenzhen Zongguan Innovation Co., Ltd. Room 225, Galaxy Lingchuang World Phase II, Longgang District, Shenzhen, Guangdong 51800, China			
Prüfgegenstand: Test item:	Robotic Lawnmower			
Bezeichnung / Typ-Nr.: Identification / Type no.:	ZMLMS212WG1; ZMLMS214WG1 (Trademark: Mowrator)			
Auftrags-Inhalt: Order content:	Test Report			
Prüfgrundlage: Test specification:	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 D01 v06 FCC KDB Publication 865664 D02 v01r02			
Wareneingangsdatum: Date of sample receipt:	2024-03-26	Please refer to Photo Document		
Prüfmuster-Nr.: Test sample no.:	A003680935-001~005			
Prüfzeitraum: Testing period:	2024-03-26 - 2024-04-26			
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:			genehmigt von: authorized by:	
Datum: Date: 2024-10-08	Signed by: Jonathan Li		Ausstellungsdatum: Issue date: 2024-10-08	Signed by: Bell Hu
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / Other:	FCC ID: 2BE7P-ZMLMS212WG1 Contains FCC ID: 2AQ6KA1004			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* 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 RADIO FREQUENCY EXPOSURE COMPLIANCE
RESULT: Pass

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1 Test Sites

1.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China

FCC Accreditation Designation No.: CN1260

1.2 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, 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 Appendix of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. 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 Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2 General Product Information

2.1 Product Function and Intended Use

The Product is a Robotic Lawnmower which supports 2.4GHz SRD function and contain a 60 GHz radar module with FCC ID: 2AQ6KA1004.
Model ZMLMS212WG1 and ZMLMS214WG1 difference lies on the motor quantity, others are the same.

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

2.2 Ratings and System Details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Product Name:	Robotic Lawnmower
Model No.:	ZMLMS212WG1, ZMLMS214WG1
Trademark:	Mowrator
FCC ID:	2BE7P-ZMLMS212WG1
Operating Voltage:	51.2V powered by battery
Testing Voltage:	51.2V powered by battery
Operating Temperature Range:	0 °C ~ 40 °C
Technical Specification of 2.4G SRD	
Operating Frequency:	2402 MHz to 2480 MHz
Type of Modulation:	FLRC(GMSK)
Channel Number:	128
Channel Separation:	600kHz
Antenna Type:	Internal antenna
Antenna Gain:	ANT1: 3.99dBi Max, ANT2: 3.67dBi Max

2.3 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

2.4 Submitted Documents

- Application Form
- ID Label and Location Info
- User Manual

3 Test Results

3.1 Transmitter Requirement & Test Suites

3.1.1 Radio Frequency Exposure Compliance

RESULT:

Pass

Test Specification

Test item	: Robotic Lawnmower
Identification / Type No.	: ZMLMS212WG1, ZMLMS214WG1
FCC ID	: 2BE7P-ZMLMS212WG1
Test standard	: CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 D01 v06 FCC KDB Publication 865664 D02 v01r02

RF Exposure Compliance Requirement for FCC

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

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

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

a) RF Exposure Evaluation standalone operations (worse case)

Mode	*Measured RF Output Power (dBm)	Antenna gain (dBi)	EIRP (dBm)	Distance (cm)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
2.4G SRD-ANT1	11.37	3.99	15.36	20	0.0068	1.0
2.4G SRD-ANT2	11.13	3.67	14.80	20	0.0060	1.0

Note:

- 2.4GHz Band RF Output Power: are conducted from test report CN24CQ8J 001.

➤ **Conclusion**

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