

MPE TEST REPORT

Applicant Suzhou ShiRuizhuo Technology Co., Ltd.
FCC ID 2BQXJ-RRAL0VER01
Product Robotic Lawn Mower
Brand roborock
Model RRAL0VER
Report No. EFTA25100248-IE-09-M1
Issue Date December 25, 2025

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 §1.1310, §2.1091**. The test results show that the equipment tested can demonstrate compliance with the requirements as documented in this report.



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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

1.3 Testing Location

Company: Eurofins TA Technology (Shanghai) Co., Ltd.
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25°C
Relative humidity	Min. = 20%, Max. = 80%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment Under Test

Client Information

Applicant	Suzhou ShiRuizhuo Technology Co., Ltd.
Applicant address	Room 508, Building C, No.112 GLP I-Park, Sutong Road, Suzhou Industrial Park District, Suzhou City, Jiangsu Province, P.R. China
Manufacturer	Suzhou ShiRuizhuo Technology Co., Ltd.
Manufacturer address	Room 508, Building C, No.112 GLP I-Park, Sutong Road, Suzhou Industrial Park District, Suzhou City, Jiangsu Province, P.R. China

General Technologies

EUT Description			
Model	RRAL0VER		
IMEI	859687061773604		
Hardware Version	VERSAHWB1		
Software Version	VERSAADB01		
Frequency	Band	TX (MHz)	RX (MHz)
	GSM 850	824 ~ 849	869 ~ 894
	PCS 1900	1850 ~ 1910	1930 ~ 1990
	WCDMA B2	1850 ~ 1910	1930 ~ 1990
	WCDMA B4	1710 ~ 1755	2110 ~ 2155
	WCDMA B5	824 ~ 849	869 ~ 894
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 5	824 ~ 849	869 ~ 894
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 12	699 ~ 716	729 ~ 746
	LTE Band 13	777 ~ 787	746 ~ 756
	LTE Band 25	1850 ~ 1915	1930 ~ 1995
	LTE Band 26	814 ~ 849	859 ~ 894
	LTE Band 38	2570 ~ 2620	2570 ~ 2620
	LTE Band 40	2300 ~ 2400	2300 ~ 2400
	LTE Band 41	2496 ~ 2690	2496 ~ 2690
	LTE Band 66	1710 ~ 1755	2110 ~ 2155
	Wi-Fi 2.4G	2400 ~ 2483.5	2400 ~ 2483.5

	Wi-Fi 5GHz (U-NII-2A)	5250 ~ 5350	5250 ~ 5350
	Wi-Fi 5GHz (U-NII-2C)	5470 ~ 5725	5470 ~ 5725
	Wi-Fi 5GHz (U-NII-3)	5725~5850	5725~5850
	Bluetooth (Low Energy)	2400 ~ 2483.5	2400 ~ 2483.5
Date of Testing	November 3, 2025~ November 20, 2025		
Date of Sample Received	October 24, 2025		
EUT Accessory			
Battery	Manufacturer: HUIZHOU DESAY BATTERY CO., LTD. Model: BRR-63C-6000HD		
Battery Charger	Manufacturer: HUIZHOU DESAY BATTERY CO., LTD. Model: TZAM01 Input: 100-240VAC 50/60Hz 2A Output: 32VDC 4.69A 150.08W		
Charging Station	Manufacturer: Dongguan Shilong Fuhua Electronic Co., Ltd. Model: MHCR01RR Rated Input 32VDC/4.69A Rated Output 32VDC/4A		
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant. 2. All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

3 Maximum Tune up and Antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by

$$\text{Numeric gain (G)} = 10^{(\text{antenna gain}/10)}$$

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power (dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

Each Tx slots maximum tune up use the most strictest factor for evaluation by making calculation.

Band		Burst-Averaged output power (adjusted for tune up) (dBm)	Division Factors	Frame-Averaged output power (adjusted for tune up) (dBm)
GSM850	GSM	34.50	-9.03	25.47
	1 Txslot	34.50	-9.03	25.47
	2 Txslots	33.00	-6.02	26.98
	3 Txslots	31.50	-4.26	27.24
	4 Txslots	30.50	-3.01	27.49
GSM1900	GSM	31.50	-9.03	22.47
	1 Txslot	31.50	-9.03	22.47
	2 Txslots	30.50	-6.02	24.48
	3 Txslots	28.50	-4.26	24.24
	4 Txslots	28.00	-3.01	24.99

Note:

Division Factors

To average the power, the division factor is as follows:

1Txslot = 1 transmit time slot out of 8 time slots

=> conducted power divided by (8/1) => -9.03 dB

2Txslots = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots

=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots

=> conducted power divided by (8/4) => -3.01 dB

Band	Maximum Tune up Tolerance		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
GSM 850	27.49	561.048	2.76	1.89
PCS 1900	24.99	315.500	3.92	2.47
WCDMA B2	25.00	316.228	3.92	2.47
WCDMA B4	25.00	316.228	3.79	2.39
WCDMA B5	25.00	316.228	2.76	1.89
LTE Band 2	25.00	316.228	3.92	2.47
LTE Band 4	25.00	316.228	3.79	2.39
LTE Band 5	25.00	316.228	2.76	1.89
LTE Band 7	25.00	316.228	4.92	3.10
LTE Band 12	25.00	316.228	-1.58	0.70
LTE Band 13	25.00	316.228	2.79	1.90
LTE Band 25	25.00	316.228	3.92	2.47
LTE Band 26	25.00	316.228	3.07	2.03
LTE Band 38	25.00	316.228	4.93	3.11
LTE Band 40	25.00	316.23	4.89	3.08
LTE Band 41	25.00	316.23	4.93	3.11
LTE Band 66	25.00	316.23	3.79	2.39
Wi-Fi 2.4G	18.00	63.10	2.09	1.62
Wi-Fi 5GHz (U-NII-2A)	17.00	50.12	2.85	1.93
Wi-Fi 5GHz (U-NII-2C)	17.00	50.12	2.85	1.93
Wi-Fi 5GHz (U-NII-3)	17.00	50.12	2.85	1.93
Bluetooth (Low Energy)	9.00	7.94	2.09	1.62

4 MPE Limit

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) 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
(ii) 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.*

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 300~1500 MHz is $f/1500$, for 1500~100,000MHz is 1.0. So

Band	The Maximum Permissible Exposure (mW/cm ²)
GSM850	0.549
GSM1900	1.000
WCDMA B2	1.000
WCDMA B4	1.000
WCDMA B5	0.549
LTE Band 2	1.000
LTE Band 4	1.000
LTE Band 5	0.549
LTE Band 7	1.000
LTE Band 12	0.466
LTE Band 13	0.518
LTE Band 25	1.000
LTE Band 26	0.543
LTE Band 38	1.000
LTE Band 40	1.000
LTE Band 41	1.000
LTE Band 66	1.000
Wi-Fi 2.4GHz	1.000
Wi-Fi 5GHz	1.000
Bluetooth LE	1.000

5 RF Exposure Evaluation Result

RF exposure evaluation method is based on KDB 447498 D01, this calculation is based on the conducted power, maximum power and antenna gain with provides the minimum separation distance. The formula shown below is from OET Bulletin 65 Edition 97-01 Per KDB 447498 D01:

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

Where: S = power density (in appropriate units, e.g. mW/cm²)

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

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	Maximum Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	PG (mW)	Result (mW/c m ²)	Limit Value (mW/cm ²)	The MPE Ratio
GSM 850	27.49	2.76	30.25	1059.254	0.211	0.549	0.384
PCS 1900	24.99	3.92	28.91	778.037	0.155	1.000	0.155
WCDMA B2	25.00	3.92	28.92	779.830	0.155	1.000	0.155
WCDMA B4	25.00	3.79	28.79	756.833	0.151	1.000	0.151
WCDMA B5	25.00	2.76	27.76	597.035	0.119	0.549	0.216
LTE Band 2	25.00	3.92	28.92	779.830	0.155	1.000	0.155
LTE Band 4	25.00	3.79	28.79	756.833	0.151	1.000	0.151
LTE Band 5	25.00	2.76	27.76	597.035	0.119	0.549	0.216
LTE Band 7	25.00	4.92	29.92	981.748	0.195	1.000	0.195
LTE Band 12	25.00	-1.58	23.42	219.79	0.044	0.466	0.094
LTE Band 13	25.00	2.79	27.79	601.17	0.120	0.518	0.231
LTE Band 25	25.00	3.92	28.92	779.83	0.155	1.000	0.155
LTE Band 26	25.00	3.07	28.07	641.21	0.128	0.543	0.235
LTE Band 38	25.00	4.93	29.93	984.01	0.196	1.000	0.196
LTE Band 40	25.00	4.89	29.89	974.990	0.194	1.000	0.194
LTE Band 41	25.00	4.93	29.93	984.011	0.196	1.000	0.196
LTE Band 66	25.00	3.79	28.79	756.833	0.151	1.000	0.151
Wi-Fi 2.4G	18.00	2.09	20.09	102.094	0.020	1.000	0.020
Wi-Fi 5GHz (U-NII-2A)	17.00	2.85	19.85	96.605	0.019	1.000	0.019
Wi-Fi 5GHz (U-NII-2C)	17.00	2.85	19.85	96.605	0.019	1.000	0.019
Wi-Fi 5GHz (U-NII-3)	17.00	2.85	19.85	96.605	0.019	1.000	0.019
Bluetooth (Low Energy)	9.00	2.09	11.09	12.853	0.003	1.000	0.003

Note: $R = 20\text{cm}$

$\pi = 3.1416$

The MPE Ratio = Mac Result $\div$ Limit Value

This device supports simultaneous transmission via WWAN and Wi-Fi 2.4G and Bluetooth.

So, the simultaneous transmitting antenna pairs as below:

TER = WWAN Antenna MPE Ratio + Wi-Fi 2.4GHz Antenna MPE Ratio + Bluetooth Antenna MPE Ratio
Ratio = $0.384 + 0.020 + 0.003 = 0.407 < 1$

So, the limit is kept.

Note: For this device, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

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