

TEST REPORT

Applicant: Rolling Wireless S.à r.l.
EUT Description: RN938V
Model: RN938V
Brand: Rolling Wireless
FCC ID: 2AX2URN938V
Standards: FCC 47 CFR Part 2.1091
Date of Receipt: 2025/11/07
Date of Issue: 2025/12/08

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



Jim Huang
Approved By:



Carey Chen
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/12/08	Original	Carey Chen

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1 General Description

1.1 Lab Information

1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014
Tel.: +86-755-27212361
Contact Email: info@towewireless.com

1.1.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.
CAB identifier: CN0152
Company Number: 31000

1.2 Client Information

1.2.1 Applicant

Applicant:	Rolling Wireless S.à r.l.
Address:	8-10 rue Mathias Hardt 1717 Luxembourg

1.2.2 Manufacturer

Manufacturer:	Rolling Wireless S.à r.l.
Address:	8-10 rue Mathias Hardt 1717 Luxembourg

1.3 Product Information

EUT Description:	RN938V			
Model:	RN938V			
Brand:	Rolling Wireless			
Hardware Version:	1			
Software Version:	AFPQ52XA_01.16.08.00			
Frequency Bands:	Band	TX Frequency		RX Frequency
	WCDMA Band II	1850 ~ 1910 MHz		1930 ~ 1990 MHz
	WCDMA Band V	824 ~ 849 MHz		869 ~ 894 MHz
	LTE Band 2	1850 ~ 1910 MHz		1930 ~ 1990 MHz
	LTE Band 4	1710 ~ 1755 MHz		2110 ~ 2155 MHz
	LTE Band 5	824 ~ 849 MHz		869 ~ 894 MHz
	LTE Band 7	2500 ~ 2570 MHz		2620 ~ 2690 MHz
	LTE Band 26 (814 ~ 824 MHz)	814 ~ 824MHz		859 ~ 869 MHz
	LTE Band 26 (824 ~ 849 MHz)	824 ~ 849 MHz		869 ~ 894 MHz
	LTE Band 38	2570 ~ 2620 MHz		2570 ~ 2620 MHz
	LTE Band 41	2496 ~ 2690MHz		2496 ~ 2690MHz
	LTE Band 66	1710 ~ 1780 MHz		2110 ~ 2200 MHz
	NR Band n2	1850 to 1910 MHz		1930 to 1990 MHz
	NR Band n5	824 to 849 MHz		869 to 894 MHz
	NR Band n7	2500 to 2570 MHz		2620 to 2690 MHz
	NR Band n26 (814 to 824 MHz)	814 to 824MHz		859 to 869 MHz
	NR Band n26 (824 to 849 MHz)	824 to 849 MHz		869 to 894 MHz
	NR Band n41	2496 to 2690 MHz		2496 to 2690 MHz
	NR Band n66	1710 to 1780 MHz		2110 to 2200 MHz
	NR Band n77	3450 to 3550 MHz		3450 to 3550 MHz
		3700 to 3980 MHz		3700 to 3980 MHz
	NR Band n78	3450 to 3550 MHz		3450 to 3550 MHz
		3700 to 3800 MHz		3700 to 3800 MHz
LTE CA:	UL CA_2C; UL CA_5B; UL CA_7C; UL CA_38C; UL CA_41C; UL CA_66C; UL CA_66B;			
ENDC:	DC_2A_n77A; DC_5A_n77A; DC_7A_n77A; DC_41A_n77A; DC_66A_n77A; DC_2A_n78A; DC_4A_n78A; DC_5A_n78A; DC_7A_n78A; DC_26A_n78A; DC_38A_n78A; DC_41A_n78A; DC_66A_n78A;			
NR CA:	CA_n2A-n77A; CA_n5A-n77A; CA_n7A-n77A; CA_n26A-n77A; CA_n66A-n77A; CA_n2A-n78A; CA_n5A-n78A; CA_n7A-n78A; CA_n26A-n78A; CA_n66A-n78A;			
Power Class:	Class 3: All			
Antenna Type:	☒ External, ☐ Integrated			
Antenna Gain:	Band	Ant (dBi)	Band	Ant (dBi)

	WCDMA Band II	4.1	NR Band n2	4.1
	WCDMA Band V	-0.5	NR Band n5	-0.5
	LTE Band 2	4.1	NR Band n7	-2.5
	LTE Band 4	4.0	NR Band n26	1.4
	LTE Band 5	-0.5	NR Band n41	2.2
	LTE Band 7	-2.5	NR Band n66	4.0
	LTE Band 26	1.4	NR Band n77	2.1
	LTE Band 38	3.0	NR Band n78	2.1
	LTE Band 41	2.2		
	LTE Band 66	4.0		

Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.

2 Maximum Permissible RF Exposure

2.1 RF Exposure Limit Introduction

§1.1310 the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b).

- (1) Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Table 1 to § 1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm)	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
300~1500			f/300	<6
1500~100000			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
300~1500			f/1500	<30
1500~100000			1.0	<30

Note: f = frequency in MHz. * = Plane-wave equivalent power density.

- (2) Occupational/controlled exposure 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. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of transient persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. In situations when an untrained person is transient through a location where occupational/controlled limits apply, he or she must be made aware of the potential for exposure and be supervised by trained personnel pursuant to § 1.1307(b)(2) of this part where use of time averaging is required to ensure compliance with the general population exposure limit. The phrase exercise control means that an exposed person is allowed and also knows how to reduce or avoid exposure by administrative or engineering work practices, such as use of personal protective equipment or time averaging of exposure.
- (3) General population/uncontrolled exposure limits apply in 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 fully aware of the potential for exposure or cannot exercise control over their exposure. For example, RF sources intended for consumer use shall be subject to the limits for general population/uncontrolled exposure in this section.

The MPE was calculated at 20cm to show compliance with the power density limit.

2.2 Equations

Power Density is given by:

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

Where:

S = Power density in mW/cm²

EIRP= Equivalent isotropic Radiated power in mW

R = Distance from transmitting antenna in cm

Power density in units of mW/cm² is converted to units of W/m² by multiplying by 10.

Distance:

$$R = \sqrt{\frac{\text{EIRP}}{4\pi S}}$$

Where:

S = Power density in mW/cm²

EIRP= Equivalent isotropic Radiated power in mW

R = Distance from transmitting antenna in cm

EIRP:

$$\text{EIRP} = P + G$$

Where:

EIRP = Equivalent isotropic Radiated power in Mw

P = Output power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

Source-Based Duty Cycle:

Where applicable (for example, multi-slot cell phone applications) a duty cycle factor may be applied.

Source-based time-averaged EIRP = (DC / 100)* EIRP

Where:

DC = Duty Cycle in %, as applicable

EIRP= Equivalent isotropic Radiated power in mW

MIMO and colocated transmitters (identical limit for all transmitters):

For multiple chain devices, and colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the PG (in linear units) of each transmitter.

Total EIRP = (EIRP 1) + (EIRP 2) + ... + (EIRP n)

MIMO and colocated transmitters:

For multiple colocated transmitters operating simultaneously in frequency bands where different limit apply:

The power density at the specified separation distance is calculated for each transmitter chain or transmitter.

The fraction of the exposure limit is calculated for each chain or transmitter as

Power density of chain or transmitter / limit applicable to the chain or transmitter.

The fractions are summed.

Compliance is established if the sum of the fractions is less than or equal to one.

3 RF Exposure Results

3.1 Standalone Exposure Calculations

For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.

The manufacturing configures output power so that the maximum power, after accounting for manufacturing tolerances, will never exceed the maximum power level measured.

The antenna gain in the tables below is the maximum antenna gain among various channels within the specified band.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	EIRP/ERP (dBm)	EIRP/ERP Limit (dBm)	Maximum Power (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Gain According to EIRP/ERP (dBi)	Gain According to Pd (dBi)	Maximum Gain Allowed (dBi)	Results
WCDMA Band II	1852.4	4.1	25.7	29.80	33.00	371.5352	0.1900	1.0000	7.30	11.31	7.30	Pass
WCDMA Band V	826.4	-0.5	25.7	23.05	38.45	371.5352	0.0402	0.5509	14.90	10.87	10.87	Pass
LTE Band 2/CA_2C	1850.7	4.1	25.7	29.80	33.00	371.5352	0.1900	1.0000	7.30	11.31	7.30	Pass
LTE Band 4	1710.7	4	25.7	29.70	30.00	371.5352	0.1857	1.0000	4.30	11.31	4.30	Pass
LTE Band 5/CA_5B	824.7	-0.5	25.7	23.05	38.45	371.5352	0.0402	0.5498	14.90	10.86	10.86	Pass
LTE Band 7/CA_7C	2502.5	-2.5	25.7	23.20	33.00	371.5352	0.0416	1.0000	7.30	11.31	7.30	Pass
LTE Band 26(814-824)	814.7	1.4	25.7	24.95	50.00	371.5352	0.0622	0.5431	26.45	10.81	10.81	Pass
LTE Band 26(824-849)	824.7	1.4	25.7	24.95	38.45	371.5352	0.0622	0.5498	14.90	10.86	10.86	Pass
LTE Band 41/CA_41C	2498.5	2.2	25.7	27.90	33.00	371.5352	0.1227	1.0000	7.30	11.31	7.30	Pass
LTE Band 66/CA_66B/CA_66C	1710.7	4	25.7	29.70	30.00	371.5352	0.1857	1.0000	4.30	11.31	4.30	Pass
NR Band n2	1852.5	4.1	25.7	29.80	33.00	371.5352	0.1900	1.0000	7.30	11.31	7.30	Pass
NR Band n5	826.5	-0.5	25.7	23.05	38.45	371.5352	0.0402	0.5510	14.90	10.87	10.87	Pass
NR Band n7	2502.5	-2.5	25.7	23.20	33.00	371.5352	0.0416	1.0000	7.30	11.31	7.30	Pass
NR Band n26(814-824)	816.5	1.4	25.7	24.95	50.00	371.5352	0.0622	0.5443	26.45	10.82	10.82	Pass
NR Band n26(824-849)	826.5	1.4	25.7	24.95	38.45	371.5352	0.0622	0.5510	14.90	10.87	10.87	Pass
NR Band n41	2501.01	2.2	25.7	27.90	33.00	371.5352	0.1227	1.0000	7.30	11.31	7.30	Pass
NR Band n66	1712.5	4	25.7	29.70	30.00	371.5352	0.1857	1.0000	4.30	11.31	4.30	Pass
NR Band n77(3450-3550)	3455.01	2.1	25.7	27.80	30.00	371.5352	0.1199	1.0000	4.30	11.31	4.30	Pass
NR Band n77(3700-3980)	3705	2.1	25.7	27.80	30.00	371.5352	0.1199	1.0000	4.30	11.31	4.30	Pass

Remark: "Maximum Power" comes from the largest "Tune-up" provided by the customer.

3.1 Multiple Sources Exposure Calculations

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE in accordance with the provisions of Table(A) and Table(B). To comply with the MPE, the fraction of the MPE in terms of E2, H2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity.

In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity.

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

TER (Total exposure ratio) = Power Density (mW/cm²) / Limit (mW/cm²)

Operating Band	Frequency (MHz)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	TER
WCDMA Band II	1852.4	0.1900	1.0000	0.1900
WCDMA Band V	826.4	0.0402	0.5509	0.0729
LTE Band 2/CA_2C	1850.7	0.1900	1.0000	0.1900
LTE Band 4	1710.7	0.1857	1.0000	0.1857
LTE Band 5/CA_5B	824.7	0.0402	0.5498	0.0730
LTE Band 7/CA_7C	2502.5	0.0416	1.0000	0.0416
LTE Band 26(814-824)	814.7	0.0622	0.5431	0.1145
LTE Band 26(824-849)	824.7	0.0622	0.5498	0.1131
LTE Band 41/CA_41C	2498.5	0.1227	1.0000	0.1227
LTE Band 66/CA_66B/CA_66C	1710.7	0.1857	1.0000	0.1857
NR Band n2	1852.5	0.1900	1.0000	0.1900
NR Band n5	826.5	0.0402	0.5510	0.0729
NR Band n7	2502.5	0.0416	1.0000	0.0416
NR Band n26(814-824)	816.5	0.0622	0.5443	0.1143
NR Band n26(824-849)	826.5	0.0622	0.5510	0.1129
NR Band n41	2501.01	0.1227	1.0000	0.1227
NR Band n66	1712.5	0.1857	1.0000	0.1857
NR Band n77(3450-3550)	3455.01	0.1199	1.0000	0.1199
NR Band n77(3700-3980)	3705	0.1199	1.0000	0.1199

The product also has multiple transmitters. The Simultaneous Transmission Possibilities are as below:

EN_DC and NR inter-band CA

The worst-case combination:

Combination	TER	Total TER	Limit	Conclusion
DC_2A_n77A	0.1900 + 0.1199	0.3099	<1	PASS
CA_n2A-n77A	0.1900 + 0.1199	0.3099	<1	PASS

~The End~