



# RF - TEST REPORT

- Human Exposure -

**Type / Model Name** : 2861-009 – Model: 861A

**Product Description** : BLE5.0 remote control

**Applicant** : ruwido austria gmbh

**Address** : Koestendorfer Strasse 8

5202 NEUMARKT, AUSTRIA

**Manufacturer** : ruwido austria gmbh

**Address** : Koestendorfer Strasse 8

5202 NEUMARKT, AUSTRIA

**Test Result** according to the standards  
listed in clause 1 test standards:

**POSITIVE**

**Test Report No. :** 80205297-01 Rev\_1

11. March 2025

Date of issue



Deutsche  
Akkreditierungsstelle  
D-PL-12030-01-00

FCC ID: XYN861A

IC: 8748A-861A

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ATTACHMENT A as separate supplement

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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## 1 TEST STANDARDS

The tests were performed according to following standards:

### **FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969**

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart J, Section 2.1093	Radiofrequency radiation exposure evaluation: <b>portable devices</b> .
KDB 447498 D01	RF Exposure procedures and equipment authorisation policies for mobile and portable devices, April 20, 2021.
ANSI C95.1: 2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
RSS-102, Issue 6	<b>Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)</b>

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## **2 EQUIPMENT UNDER TEST**

### **2.1 Information provided by the Client**

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

### **2.2 Sampling**

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according to his/her instructions.

### **2.3 Photo documentation of the EUT – See ATTACHMENT A**

### **2.4 Equipment type**

BLE device

### **2.5 Short description of the equipment under test (EUT)**

The EUT is a Bluetooth Low Energy wireless remote control. A single PCB antenna is used within the system. The EUT has only one integrated antenna, no temporary connector and no external antenna can be connected.

Number of tested samples:	1x radiated sample	1x conducted sample
Serial number:	169076	prototype
Firmware version:	0.0.235	0.0.235

### **2.6 Variants of the EUT**

There are no variants.

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## 2.7 Operation frequency and channel plan

The operating frequency is 2400 MHz to 2483.5 MHz.

Channel plan:

Channel	Frequency	Channel	Frequency
37	2402	18	2442
0	2404	19	2444
1	2406	20	2446
2	2408	21	2448
3	2410	22	2450
4	2412	23	2452
5	2414	24	2454
6	2416	25	2456
7	2418	26	2458
8	2420	27	2460
9	2422	28	2462
10	2424	29	2464
38	2426	30	2466
11	2428	31	2468
12	2430	32	2470
13	2432	33	2472
14	2434	34	2474
15	2436	35	2476
16	2438	36	2478
17	2440	39	2480

Note: the marked frequencies are determined for final testing.

## 2.8 Transmit operating modes

The EUT uses GFSK modulation and may provide following data rates:

- 1000 kbps
- 2000 kbps

## 2.9 Antennas

The following antennas shall be used with the EUT:

The EUT has only an integrated PCB antenna with -2 dBi gain, no temporary connector and no external antenna to be connected.

## 2.10 Power supply system utilised

Power supply voltage,  $V_{nom}$  : 3 V<sub>DC</sub> battery powered

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### 3 TEST RESULT SUMMARY

Operating in the 2400 MHz – 2483.5 MHz band:

FCC Rule Part	RSS Rule Part	Description	Result
KDB 447498, 7.1	RSS 102, 6.6	MPE	not applicable
KDB 447498, 4.3.1	RSS 102, 6.3	SAR exclusion consideration	passed
KDB 447498, 7.2	RSS102, 7.1.5	Co-location, Co-transmission	not applicable

#### 3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80205297-01	0	17 October 2024	Initial test report
80205297-01	1	11. March 2025	Antenna gain corrected, EIRP corrected

The test report with the highest revision number replaces the previous test reports.

#### 3.2 Final assessment

The equipment under test fulfills the requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 15 April 2024

Testing concluded on : 25 April 2024

Checked by:

Tested by:

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Klaus Gegenfurtner  
Teamleader Radio

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Christopher Thaller  
Radio Team

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## **4 TEST ENVIRONMENT**

### **4.1 Address of the test laboratory**

**CSA Group Bayern GmbH  
Ohmstrasse 1-4  
94342 STRASSKIRCHEN  
GERMANY**

### **4.2 Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15 - 35 °C

Humidity: 30 - 60 %

Atmospheric pressure: 86 - 106 kPa

### **4.3 Statement of the measurement uncertainty**

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor  $k = 2$ . The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

### **4.4 Conformity Decision Rule**

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule ( $w = 0$ ).

Details can be found in the procedure CSA\_B\_V50\_29.

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## 5 HUMAN EXPOSURE

### 5.1 RF Output Power

The RF output power is taken from the test report 80205297-00 issued by CSA Group.

RSS-247 5.4 (d)							
Modulation	Channel	Frequency	Measured Conducted TX Power	Antenna gain	Calculated EIRP	EIRP Limit	Margin
		MHz	dBm	dB	dBm	dBm	dB
1 Mbps	CH37	2402	2.8	-2.0	0.8	36	-35.2
	CH18	2442	2.5	-2.0	0.5	36	-35.5
	CH39	2480	2.2	-2.0	0.2	36	-35.8
2 Mbps	CH37	2402	2.7	-2.0	0.7	36	-35.3
	CH18	2442	2.5	-2.0	0.5	36	-35.5
	CH39	2480	2.3	-2.0	0.3	36	-35.7

**Remarks:** As worst case power the peak power is not averaged over time.



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## 5.2 SAR test exclusion considerations

### 5.2.1 Applicable standard

According to RF exposure guidance:

Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

### 5.2.2 Determination of the standalone SAR test exclusion threshold

#### For BLE device:

The minimum separation distance results from the application of the BLE remote control which is handled by hand. This distance is assumed to 5 mm from antenna to the hand of the user.  
The threshold for 1-g is determined.

The formula under 4.3.1 1) for 100 MHz to 6 GHz for standalone equipment is used:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3;$$

The max conducted rf output power is according the equipment:

Modulation	Channel frequency (MHz)	conducted Power (dBm)	antenna gain (dBi)	tune-up tolerance (dB)	EIRP (dBm)	EIRP (mW)	1-g SAR (1)	Limit 1-g SAR (1)
1 Mbps	2402	2.8	-2	1	1.8	1.51	0.47	3.0
	2442	2.5	-2	1	1.5	1.41	0.44	3.0
	2480	2.2	-2	1	1.2	1.32	0.42	3.0
2 Mbps	2402	2.7	-2	1	1.7	1.48	0.46	3.0
	2442	2.5	-2	1	1.5	1.41	0.44	3.0
	2480	2.3	-2	1	1.3	1.35	0.42	3.0

**Conclusion: The Threshold level is lower than the limit, SAR measurement is not necessary.**

The requirements are **FULFILLED**.

**Remarks:** None.

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### 5.3 Exemption limits for routine evaluation - SAR evaluation

#### 5.3.1 Applicable standard

According to RSS-102, item 2.5.1:

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance 4, 5

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤ 300	45	116	139	163	189
450	32	71	87	104	124
835	21	32	41	54	72
1900	6	10	18	33	57
<b>2450</b>	<b>3</b>	<b>7</b>	<b>16</b>	<b>32</b>	<b>56</b>
3500	2	6	15	29	50
5800	1	5	13	23	32

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤ 300	216	246	280	319	362
450	147	175	208	248	296
835	96	129	172	228	298
1900	92	138	194	257	323
2450	89	128	170	209	245
3500	72	94	114	134	158
5800	41	54	74	102	128

**4** The exemption limits in Table 1 are based on measurements and simulations of half-wave dipole antennas at separation distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from a linear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from a third order polynomial fit.

**5** Transmitters operating between 0.003-10 MHz, meeting the exemption from routine SAR evaluation, shall demonstrate compliance to the instantaneous limits in Section 4.

**FCC ID: XYN861A****IC: 8748A-861A****5.3.2 Conclusion according to RSS-102.**

Maximum output power at 2450 MHz, **1.5 mW** is < 3 mW;

**For the EUT is SAR measurement is NOT necessary**

The requirements are **FULFILLED**.

**Remarks:** None.

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