



RF - TEST REPORT

- Human Exposure -

Type / Model Name : 2830-015 – Model: 817A

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

<p>Test Result according to the standards listed in clause 1 test standards:</p>	<p>POSITIVE</p>
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<p>Test Report No. : 80197012-01 Rev_4</p>	<p>05. May 2025 _____ Date of issue</p>
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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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IC ID: 8748A-817A

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ATTACHMENT A as separate supplement

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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 2, Subpart J, Section 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
Part 2, Subpart J, Section 2.1093	Radiofrequency radiation exposure evaluation: portable devices.
KDB 447498 D01	RF Exposure procedures and equipment authorisation policies for mobile and portable devices
RSS-102, Issue 6	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

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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: 2
Serial number: 169069
Firmware version: 0.0.228

2.6 Variants of the EUT

There are no variants.

2.7 Operation frequency and channel plan

The operating frequency is 2400 MHz to 2483.5 MHz.

2.8 Transmit operating modes

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

- 1000 kbps
- 2000 kbps (kbps = kilobits per second)

2.9 Antennas

The following antennas shall be used with the EUT:

The EUT has only an integrated PCB antenna with max. 0 dBi gain, no external antenna to be connected.

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2.10 Power supply system utilised

Power supply voltage, V_{nom} : 3 V_{DC} battery powered

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3 TEST RESULT SUMMARY

BLE 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	Field reference level exposure exemption	not applicable
KDB 447498, 4.3.1	RSS 102, 6.3	SAR exemption limits	passed
KDB 447498, 7.2	RSS102, 8.2	Co-location, Co-transmission	not applicable

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80197012-01	0	22 March 2024	Initial test report
80197012-01	1	26. July 2024	Gain and tune-up tolerance added
80197012-01	2	26. November 2024	Antenna gain from antenna information used
80197012-01	3	18. March 2025	References to RSS 102 Issue 6
80197012-01	4	5. May 2025	Measurements of not used data rates taken out of testreport

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

3.2 Final assessment

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

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

Testing commenced on : 08 February 2024

Testing concluded on : 27 February 2024

Checked by:

Tested by:

Klaus Gegenfurtner
Teamleader Radio

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 80179012-00 issued by CSA Group.

FCC §15.247 (b)(3) RSS-247 5.4 (d)					
Modulation	Channel	Frequency	Measured Conducted	Conducted Tx-Power	Margin
		MHz	dBm	dBm	dB
1 Mbps	CH37	2402	4.0	30.0	-26.0
	CH18	2442	3.8	30.0	-26.2
	CH39	2480	3.3	30.0	-26.8
2 Mbps	CH37	2402	4.0	30.0	-26.0
	CH18	2442	3.7	30.0	-26.3
	CH39	2480	3.1	30.0	-26.9

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 remote which is handled by hand. This distance is assumed to be 5 mm from antenna to the hand of the user.

The hand of the user is the nearest extremity of a human being therefore the threshold for 10-g is determined.

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

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, 5 mm})] * [\sqrt{f(\text{GHz})}] \leq 7.5 \text{ for } 10 \text{ g SAR.}$$

Power allowed at *numeric threshold* for **5 mm** separation distance:

$$\begin{aligned} \text{max. power} &= \{7.5 / \sqrt{f(\text{GHz})} [\text{min. test separation distance (mm)}]\} \text{ mW} \\ &= \{7.5 / \sqrt{2.480 * 5.0}\} \text{ mW} \\ &= \mathbf{23.8 \text{ mW}} \end{aligned}$$

Modulation	Channel	Frequency	Measured Conducted TX Power	Antenna gain	tune-up tolerance	EIRP	Threshold level	Limit 10-g SAR
		MHz	dBm	dBi	dB	mW		
1 Mbps	CH37	2402	4.0	-0.8	1.0	2.64	0.82	7.5
	CH18	2442	3.8	-0.2	1.0	2.86	0.89	7.5
	CH39	2480	3.3	0.0	1.0	2.66	0.84	7.5
2 Mbps	CH37	2402	4.0	-1.8	1.0	2.08	0.64	7.5
	CH18	2442	3.7	-0.4	1.0	2.69	0.84	7.5
	CH39	2480	3.1	-0.1	1.0	2.54	0.80	7.5

Conclusion: The maximum power level of 2.96 mW is lower than the allowed power of 23.8 mW at a separation distance of 5 mm, thus SAR measurement is NOT necessary.

The requirements are **FULFILLED**.

Remarks: None.

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5.3 Exemption limits for routine evaluation according to ISED

5.3.1 Applicable standard

According to RSS-102, section 6.3:

Devices operating at or below the applicable output power levels (adjusted for tune-up tolerance) specified in table 11, based on the separation distance, are exempt from SAR evaluation. The separation distance, defined as the distance between the user and/or bystander and the antenna and/or radiating element of the device or the outer surface of the device, shall be less than or equal to 20 cm for these exemption limits to apply.

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

Frequency (MHz)	Exemption Limits (mW)				
	≤5 mm	10 mm	15 mm	20 mm	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
2450	3	7	16	32	56
3500	2	6	15	29	50
5800	1	5	13	23	32

Frequency (MHz)	Exemption Limits (mW)				
	30 mm	35 mm	40 mm	45 mm	≥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

The exemption limits in table 11 Table 11 are based on measurements and simulations of half-wave dipole antennas at separation distances of 5 mm to 50 mm from a flat phantom, which provides a SAR value of approximately 0.4 W/kg for 1 g of tissue.

For limb-worn devices where the 10 gram of tissue applies, the exemption limits for routine evaluation in table 11 are multiplied by a factor of 2.5.

For controlled-use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 11 are multiplied by a factor of 5.

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5.3.2 Conclusion according to RSS-102.

Modulation	Channel	Frequency	Measured Conducted TX Power	Antenna gain	tune-up tolerance	EIRP
		MHz	dBm	dBi	dB	mW
1 Mbps	CH37	2402	4.0	-0.8	1.0	2.64
	CH18	2442	3.8	-0.2	1.0	2.86
	CH39	2480	3.3	0.0	1.0	2.66
2 Mbps	CH37	2402	4.0	-1.8	1.0	2.08
	CH18	2442	3.7	-0.4	1.0	2.69
	CH39	2480	3.1	-0.1	1.0	2.54

Maximum output power is **2.86 mW < 3 mW**;

For the EUT SAR measurement is NOT necessary

The requirements are **FULFILLED**.

Remarks: None.

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