



RF - TEST REPORT

- Human Exposure -

Type / Model Name : ULR01

Product Description : RFID Reader

Applicant : Dürr Dental SE

Address : Höfigheimer Str. 17

74321 Bietigheim-Bissingen, GERMANY

Manufacturer : Dürr Dental SE

Address : Höfigheimer Str. 17

74321 Bietigheim-Bissingen, GERMANY

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

POSITIVE

Test Report No. : **80115210-04 Rev_0**

09. June 2022

Date of issue



Deutsche
Akkreditierungsstelle
D-PL-12030-01-03
D-PL-12030-01-04

FCC ID: 2ATTE-2162100005

IC ID: 25412-2162100005

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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 2, Section 2.1091 Radiofrequency radiation exposure evaluation: **mobile devices**.

Part 1, Subpart 2, Section 2.1093 Radiofrequency radiation exposure evaluation: **portable devices**.

KDB 447498 D04 v01 RF Exposure procedures and equipment authorisation policies for mobile and portable devices, November 29, 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

ETSI TR 100 028 V1.3.1: 2001-03, Electromagnetic Compatibility and Radio Spectrum Matters (ERM);
Uncertainties in the Measurement of Mobile Radio Equipment
Characteristics—Part 1 and Part 2

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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 his/her instructions.

2.3 Photo documentation of the EUT – See ATTACHMENT A



2.4 Equipment type, category

Select equipment type, portable equipment.

2.5 Short description of the equipment under test (EUT)

ULR01 is a RFID reader, which can be connected via USB cable to a computer. It reads RFID tags (e.g. of image plates) and transfers that data to a software on the connected computer.

The Reader uses the NFC controller NXP PN7150 to communicate with RFID-Tags. Tags complying to standard ISO15693 are supported. The modulation on PN7150 side is 100% Amplitude Shift Keying (ASK) pulse position coded. The RFID-Tag uses subcarrier load modulation with manchester bit coding.

Number of tested samples: 1
Serial number: P464875007

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2.6 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

- Continuously tag reading at 13.56 MHz (full power).

2.7 Antennas

The EUT has an internal antenna that is printed directly on the PCB.
The dimensions are 3 cm x 2 cm.

2.8 Power supply system utilised

Power supply voltage is:

$V_{\text{nom}} = 5.00 \text{ V DC}$ (powered over USB)

The extreme voltage for the EUT is:

$V_{\text{min}} = 4.75 \text{ V DC}$

$V_{\text{max}} = 5.25 \text{ V dC}$

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3 TEST RESULT SUMMARY

WLAN device using digital modulation:

Operating in the 2400 MHz – 2483.5 MHz and 5725 MHz – 5850 MHz band:

FCC Rule Part	RSS Rule Part	Description	Result
KDB 447498, 2.1.2	-	1-mW Test Exemption	passed
-	RSS 102, 2.5.1	Exemption Limits for Routine Evaluation – SAR Evaluation	passed

The mentioned RSS Rule Parts in the above table are related to:
RSS 102, Issue 5, March 2015

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80115210-04	0	09 June 2022	Initial test report

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 : 23 February 2022

Testing concluded on : 05 April 2022

Checked by:

Tested by:

 Jürgen Pessinger
2022.06.09
07:43:14 +02'00'

Jürgen Pessinger
Deputy Teamleader Radio

 Josef Knab
I'm the autor of this
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2022.06.09 07:18:34 +02'00'

Josef Knab
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 Exposure Test Exemptions for Single Source

5.1.1 Applicable standard

RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

5.1.2 1-mW Test Exemption

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(d[\text{m}]) - 104.77$$

where:

- E is the field strength in dB μ V/m;
- d is the measurement distance in m;
- EIRP is the equivalent isotropically radiated power in dBm.

Frequency [MHz]	Measured Field Strength [dB μ V/m @ 3m]	Calculated EIRP [dBm]	Calculated EIRP [mw]	RF Exposure Limit [mW]	Result
13.56	49.8	-45.4	0.000029	1	passed

The requirements are **FULFILLED**.

Remarks: The result was taken from the test report of CSA Group Bayern GmbH "80115210-02 Rev_0".
Conclusion: SAR evaluation is not needed.

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5.2 Exemption limits for routine evaluation - SAR evaluation

5.2.1 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	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

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	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	88 mW	195 mW	213 mW
835	80 mW	92 mW	177 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

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.

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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5.2.2 Conclusion according RSS-102.

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} + 20 \log(d[\text{m}]) - 104.77$$

where:

- E is the field strength in dB μ V/m;
- d is the measurement distance in m;
- EIRP is the equivalent isotropically radiated power in dBm.

Frequency [MHz]	Measured Field Strength [dB μ V/m @ 3m]	Calculated EIRP [dBm]	Calculated EIRP [mw]	Exemption Limit [mW]	Result
13.56	49.8	-45.4	0.000029	72	passed

The requirements are **FULFILLED**.

Remarks: The result was taken from the test report of CSA Group Bayern GmbH "80115210-02 Rev_0".

Conclusion: SAR evaluation is not needed.

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.