

Prüfbericht-Nr.: <i>Test report no.:</i>	DE24B8W8 002	Auftrags-Nr.: <i>Order no.:</i>	1171327_10	Seite 1 von 10 <i>Page 1 of 10</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	CPN0002 UL	Auftragsdatum: <i>Order date:</i>	2024-07-31	
Auftraggeber: <i>Client:</i>	Robert Bosch GmbH, Markwiesenstrasse 58, 72770 Reutlingen, Germany			
Prüfgegenstand: <i>Test item:</i>	Mini Remote			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	BRC3300			
Auftrags-Inhalt: <i>Order content:</i>	Prüfung der Funkparameter nach FCC & ISED <i>Test of radio parameters acc. to FCC & ISED</i>			
Prüfgrundlage: <i>Test specification:</i>	Vollprüfung / Complete test RF exposure evaluation acc. to FCC CFR 47 § 1.1307 RF exposure evaluation acc. to RSS-102 issue 6			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-07-19			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003773899-001 to 010			
Prüfzeitraum: <i>Testing period:</i>	2024-07-30 - 2024-08-06			
Ort der Prüfung: <i>Place of testing:</i>	Nürnberg <i>Nuremberg</i>			
Prüflaboratorium: <i>Testing laboratory:</i>	Wireless Labor <i>Wireless Test Lab</i>			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>		genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i>	12.09.2024 Signed by: Shrinivas Naikar	Datum: <i>Issue date:</i>	12.09.2024 Signiert von: Matthias Kraeutlein	
Stellung / Position	Sachverständige(r)/Expert	Stellung / Position	Sachverständige(r)/Expert	
Sonstiges / Other : USA/FCC: C2PC filing for change in Transmit power level setting and adding a metal clip in new Device. Dieser Prüfbericht DE24B8W8 -002 ersetzt den Prüfbericht DE24B8W8 -001 (siehe Änderungsverzeichnis) / The test report DE24B8W8 -002 replaces the test report DE24B8W8 -001 (see change history).				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend 3 = satisfactory	4 = ausreichend 4 = sufficient
* Legende:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>
5	Wenn auf dem Bericht kein Akkreditierungshinweis aufgebracht ist, wurde der Bericht nicht im akkreditierten Bereich erstellt und ist folglich auch nicht vom EA MLA abgedeckt. Unabhängig davon wurde der Bericht auf Basis der allgemeinen Regeln der ISO/IEC 17000er Reihe erstellt. Mit "#" gekennzeichnete Prüfungen sind nicht Bestandteil der Akkreditierung D-PL-14169-03-00. <i>If there is no accreditation notice on the report, the report has not been produced in the accredited area and is consequently not covered by the EA MLA. Regardless of this, the report has been prepared based on the general rules of the ISO/IEC 17000 series. Tests marked with "#" are not covered by the accreditation D-PL-14169-03-00.</i>

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Produktbeschreibung
Product description

1	Test item	Mini Remote
2	Typ-No.	BRC3300 (Tested)
3	Identical Types	BRC3310
4	Test sample obtaining	☒ Sampling by customer ☐ Sampling by TÜV Rheinland Group ☐ others:
5	Serial-No.	-
6	Supported radio technologies evaluated in this report	Bluetooth Low Energy
7	Supported radio technologies not evaluated in this report	None
8	Description of EUT	Sets up a BLE connection to transmit button press information to eBike.
9	Max RF output power (measured)	-4.8 dBm
10	Operating Frequency (declared)	BLE: 2402-2480MHz
11	Channel Bandwidth (declared)	BLE: 2MHz
12	Number of Channels	BLE: 40
13	Modulation	BLE: GFSK
14	Rated Voltage / Frequency	3V DC (Coin Cell Powered)
15	FCC-ID (Radio module)	2AWRC-BRC3300
16	IC (Radio module)	26294-BRC3300
17	Antenna Name	CERAMIC ANTENNA P/N: RFECA3216060A1T
18	Radio Module / Antenna Type	☒ Radio module with antenna on module PCB ☐ Radio module with dedicated antenna ☐ Radio module with user accessible antenna connector
19	Radio Module Certification	☒ Certified radio module ☐ Certified radio module with given antenna
20	Antenna Type	☒ Integral antenna (designed as a fixed part of the EUT) ☐ Dedicated antenna (removable, obligation to be used) ☐ Permanent antenna connector
21	Antenna number of chains	1
22	Antenna Gain (declared)	2 dBi
23	Software / Firmware	1.3.21
24	Hardware	1.2.2
25	Provided Samples	A003773899-001 to 010
26	Conducted measurements sample	A003773899-002
27	Radiated measurements sample	A003773899-001
28	Companion Device used for radio connection with the EUT	EUT in Test Mode. Therefore, no Companion Device was used.
29	Auxiliary equipment used to set up the EUT	PC with USB-to Serial adapter (Tüv Rheinland)
30	Accessory Devices used together with the EUT	-
31	Temperature Range	-20°C to +60°C
32	Environment	Indoor and Outdoor

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Absatz <i>Clause</i>	Anforderungen – Prüfungen / <i>Requirements - Tests</i>	Bemerkungen / <i>Remarks</i>	Ergebnis <i>Result</i>
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FCC CFR 47 § 1.1307	RF exposure evaluation	-	P ☒ F ☐ N/A ☐ N/T ☐
RSS-102 Issue 6	RF exposure compliance of radiocommunication apparatus	-	P ☒ F ☐ N/A ☐ N/T ☐

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1 EUT Classification

1.1 Wireless technologies and frequencies supported by the EUT

The named technologies are only those falling in the specification of the applied standard.

Technology	Frequency Range (TX)	TX Function	Test report
BLE	2400 MHz - 2483.5 MHz	SISO	DE24Z79Y 001

1.2 Standard specific classification of the EUT

1.2.1 Applied standards.

- FCC CFR 47 Part 1 Subpart I §1.1307 (b), 447498 D01 General RF Exposure Guidance v06
- FCC CFR 47 Part 1 Subpart I §1.1310 (limits)
- RSS-102 issue 6

1.2.2 Exposure conditions

	Type of exposure
☒	General public exposure
☐	Occupational exposure

	Type of transmitter
☒	Single RF source
☐	multiple RF sources
☐	multiple RF sources with simultaneous transmission

Number of RF sources:

Number of RF sources:

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2 Test results in detail

2.1 FCC

Requirements

FCC §1.1307(b)(1)(i)

With respect to the limits on human exposure to RF provided in § 1.1310, applicants to the Commission for the grant or modification of construction permits, licenses or renewals thereof, temporary authorities, equipment authorizations, or any other authorizations for radio frequency sources must either

- (A) Determine that they qualify for an exemption pursuant to § 1.1307(b)(3);
- (B) Prepare an evaluation of the human exposure to RF radiation pursuant to § 1.1310 and include in the application a statement confirming compliance with the limits in § 1.1310; or
- (C) Prepare an Environmental Assessment if those RF sources would cause human exposure to levels of RF radiation in excess of the limits in § 1.1310.

Exemption Evaluation:

SAR test exclusion in accordance with KDB 447498

The 1-g and 10-g SAR test exclusion thresholds are determined by

: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times \sqrt{f(\text{GHz})}$
 ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, 30 where

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison.

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

SAR Exclusion calculation table for portable device.

RF tune-up tolerance values as 0.5dB (Declared by the customer).

Result:

Radio Protocol	Max Conducted Power (dBm)/(mW)	Max Conducted Power (mW) including RF tolerance	Frequency (MHz)	Separation Distance in mm	Calculated SAR test exclusion threshold value	Limit (1-g SAR) [mW]	Limit (10-g SAR) [mW]
BLE 5.0	-4.8/0.3311	0.3715	2402	5	0.1149	3	7.5

The calculated SAR test exclusion values is less than 3; therefore, qualifies for SAR test exclusion.

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2.2 ISED

Requirements

Limit:

RSS 102 issue 6, chapter 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

Frequenc y (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

Considering the separation distance of 5 mm as declared by the customer and a frequency of 2450 MHz the maximum output power at 5 mm distance is 3 mW= 4.771 dBm.

Over linear interpolation the limit for 2402 MHz is given with 3.26 mW $\pm$ 5.132 dBm and for 2480 MHz with 2.97 mW $\pm$ 4.727 dBm.

Evaluation of Compliance:

As it can be seen in the Report DE24Z79Y 001 measured maximum conducted output power is -4.8 dBm and the tune-up tolerance is 0.5dB as declared by the customer, so the same maximum conducted power is considered for the evaluation.

Radio Protocol	Max Conducted Power (dBm)/(mW)	Max Conducted Power (mW) including RF tolerance	Frequency (MHz)	Separation Distance in mm	Calculated SAR test exclusion threshold value	Limit at 2402 MHz [mW]	Limit at 2480 MHz [mW]
BLE 5.0	-4.8/0.3311	0.3715	2402	5	0.1149	3.26	2.97

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Result:

The equipment is compliant according to RSS 102 issue 6 because the constraint for the output power level at the separation distance for SAR evaluation exemption is met.

Final test result

Pass

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Änderungsverzeichnis
Change history

3 Change history

Revision Number	List of revisions	Date of issue
DE24B8W8 001	Initial Release	03.09.2024
DE24B8W8 002	Customer comment Addressed in the first page	12.09.2024
Note: Latest revision report will replace all previous reports.		

Ende des Prüfberichts
End of Test Report