Test report no.: *Prüfbericht-Nr.:*	**CN247U9R 002**	**Order No.:** *Auftragsnr.:*	168467440	**Page 1 of 10** *Seite 1 von 10*
Client reference no.: *Kunden-Referenz-Nr.:*	N/A	**Order date:** *Auftragsdatum:*	2024-01-18	
Client: *Auftraggeber:*	Honeywell (Beijing) Technology Solutions Labs Co., Ltd. A1 Building, C&W Industry Zone, No.14 Jiuxianqiao Road, Chaoyang District, 100015, Beijing, P.R. China			
Test item: *Prüfgegenstand:*	Thermostat			
Identification / Type no.: *Bezeichnung / Typ-Nr.:*	TC320B-G			
Order content: *Auftrags-Inhalt*:	Test Report			
Test specification *Prüfgrundlage:*	47 CFR FCC Part 2.1091 RSS-102 Issue 5			
Date of sample receipt: *Wareneingangsdatum:*	2024-01-05	Please refer to Photo Document		
Test sample no: *Prüfmuster-Nr.:*	A003636915-001			
Testing period: *Prüfzeitraum:*	2024-01-29 - 2024-02-20			
Place of testing: *Ort der Prüfung:*	Refer to section 2.1			
Testing laboratory: *Prüflaboratorium:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Test result*: *Prüfergebnis*:*	Pass			

tested by: *geprüft von:*	x Bell Hu Signed by: Bell Hu	**authorized by:** *genehmigt von:*	x Jonathan Li Signed by: Jonathan Li
Date: 2024-05-06 *Datum:*		**Issue date:** 2024-05-06 *Ausstellungsdatum:*	
Position / *Stellung*:	Expert/Sachverständige(r)	**Position** / *Stellung*:	Expert/Sachverständige(r)

Other: *Sonstiges:*
FCC ID: 2ARTN-00010
IC: 24552-00010
HVIN: 819203
PMN: TC320B-G

Condition of the test item at delivery: *Zustand des Prüfgegenstandes bei Anlieferung:*
Test item complete and undamaged
Prüfmuster vollständig und unbeschädigt

* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet

V05

Remarks
Anmerkungen

1	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. *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.*
2	As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. *Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.*
3	Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report. *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.*
4	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. *Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen 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 bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.*

TEST SUMMARY

3.1.1 RF EXPOSURE COMPLIANCE

RESULT: Pass

CONTENTS

1. TEST SITES

1.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.

Address: No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

1.2 TRACEABILITY

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.3 CALIBRATION

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

1.4 LOCATION OF ORIGINAL DATA

The original copies of all test data taken during actual testing were attached at Appendixes of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

1.5 STATUS OF FACILITY USED FOR TESTING

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen 518110, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2. General Product Information

2.1 General Description

The product is thermostat as an advanced, highly configurable device providing building automation connectivity well-suited for commercial building applications. This device supports Wi-Fi 2.4GHz and Bluetooth (Low Energy) technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 Rating and System Details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Thermostat
Type Designation:	TC320B-G
FCC ID:	2ARTN-00010
IC:	24552-00010
PMN:	TC320B-G
HVIN:	819203
Rated voltage:	AC 24V, 50/60Hz
Operating Voltage Range:	AC 20V - 30V
Testing Voltage:	AC 24V via AC/AC transformer
Operating Temperature Range:	0 °C - 50 °C

3. TEST RESULTS

3.1 TRANSMITTER REQUIREMENTS & TEST SUITES

3.1.1 RF Exposure Compliance

RESULT: **Pass**

Test standard	:	RSS-102 Issue 5 FCC Part 2.1091
Limit	:	Table 1 of 47 CFR FCC Part 1.1310 Section 2.5.2 of RSS-102 Issue 5
Kind of test site	:	Shielded room

This device is mobile device, and the applicant declares that the minimum separation distance is greater than 20cm. Therefore MPE measurement or computational modelling should be used to determine compliance.

MPE Calculation is based on the conducted power, and considering maximum power and Antenna gain. The following formula is used to MPE evaluation.

$$Pd = \frac{Pout * G}{4R^2\pi}$$

Where
P_d = power density in mW/cm^2 or W/m^2
P_{out} = output power to antenna in mW or W
G_{num} = Antenna gain in numeric
π = 3.14159
R = Distance between observation point and the center of radiator in cm or m

3.1.1.1 FCC Part 1.1310, Part 2.1091

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

Table 2: Test Results of RF Exposure Calculations for FCC, stand-alone mode

Operating Mode	Max. EIRP incl. tune-up (dBm)	Distance (cm)	MPE P_d (mW/cm^2)	Limit (mW/cm^2)	Verdict
BLE	15.973	20	0.008	1.0	Pass
2.4G Wi-Fi	23.893	20	0.049	1.0	Pass

1. RF Output Power above: Refer to test reports CN247U9R 001.
2. EIRP= Average Conducted Power + Directional Gain

Table 3: Test Results of RF Exposure Calculations for FCC, Simultaneous mode

Operating Mode (Worst-Case)	Sum of the MPE ratios for all simultaneously	Limit	Verdict
BLE + 2.4GHz Wi-Fi	0.057, far less than limit	1.0	Pass

3.1.1.2 RSS-102 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:
• below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 4.49/f0.5 W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Table 4: Test Results of RF Exposure Calculations for ISED, Stand-alone mode

Operating Mode	Max. EIRP incl. tune-up (dBm)	Distance (cm)	Maximum EIRP (W)	Threshold power (W)	Verdict
BLE	15.973	20	0.040	2.68	Pass
2.4G Wi-Fi	23.893	20	0.245	2.70	Pass
Note: The maximum EIRP lower than the threshold power in section 2.5.2, thus compliant.					

1. RF Output Power above: Refer to test reports CN247U9R 001.
2. EIRP= Average Conducted Power + Directional Gain

Table 5: Test Results of RF Exposure Calculations for ISED, Simultaneous mode

Operating Mode (Worst-Case)	Sum of the ratios	Limit	Verdict
BLE + 2.4GHz Wi-Fi	0.040/2.68+0.245/2.70=0.11, far less than 1.0	1.0	Pass

4. LIST OF TABLES