

<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>CN24XQRZ 002</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	168490597	Seite 1 von 22 <i>Page 1 of 22</i>
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	N/A	<b>Auftragsdatum:</b> <i>Order date:</i>	2024-06-24	
<b>Auftraggeber:</b> <i>Client:</i>	Xiaomi Communications Co., Ltd. #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, 100085, China			
<b>Prüfgegenstand:</b> <i>Test item:</i>	Xiaomi Electric Scooter 5 Pro			
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	DDHBC50ZM			
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	Test Report			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 3 August 2023 RSS-Gen Issue 5 February 2021			
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2024-06-22	Please refer to Photo Document		
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	A003763811-001~004			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2024-06-28 - 2024-07-23			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass			
<b>geprüft von:</b> <i>tested by:</i>	<u>X Bell Hu</u>	<b>genehmigt von:</b> <i>authorized by:</i>	<u>X Jonathan Li</u>	
<b>Datum:</b> <i>Date:</i>	2024-09-14 <small>Signed by: Bell Hu</small>	<b>Ausstellungsdatum:</b> <i>Issue date:</i>	2024-09-14 <small>Signed by: Jonathan Li</small>	
<b>Stellung / Position:</b>	Sachverständige(r)/Expert	<b>Stellung / Position:</b>	Sachverständige(r)/Expert	
<b>Sonstiges /</b> <i>Other:</i>	FCC ID: 2AFZZ-MHBC50ZM IC: 25903-MHBC50ZM HVIN: DDHBC50ZM, PMN: Xiaomi Electric Scooter 5 Pro			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
<small>* Legende:</small>	<small>P(ass) = entspricht o.g. Prüfgrundlage(n)</small>	<small>F(ail) = entspricht nicht o.g. Prüfgrundlage(n)</small>	<small>N/A = nicht anwendbar</small>	<small>N/T = nicht getestet</small>
<small>* Legend:</small>	<small>P(ass) = passed a.m. test specification(s)</small>	<small>F(ail) = failed a.m. test specification(s)</small>	<small>N/A = not applicable</small>	<small>N/T = not tested</small>
<b>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.</b> <i>This test report only relates to the above mentioned 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>				

Prüfbericht-Nr.: CN24XQRZ 002  
Test report no.:

Seite 2 von 22  
Page 2 of 22

**Anmerkungen**  
Remarks

- |   |  |
|---|--|
| 1 | <p>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.<br/>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><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></p>   |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.<br/>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.<br/>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>  |
| 4 | <p>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.</p> <p><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></p>   |

## **Test Summary**

**5.1.1 ANTENNA REQUIREMENT**

*RESULT: Pass*

**5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER**

*RESULT: Pass*

**5.1.3 CONDUCTED POWER SPECTRAL DENSITY**

*RESULT: Pass*

**5.1.4 6dB BANDWIDTH**

*RESULT: Pass*

**5.1.5 99% BANDWIDTH**

*RESULT: Pass*

**5.1.6 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH**

*RESULT: Pass*

**5.1.7 RADIATED SPURIOUS EMISSION**

*RESULT: Pass*

**5.1.8 CONDUCTED EMISSION ON AC MAINS**

*RESULT: Pass*

## Contents

<b>1</b>	<b>GENERAL REMARKS .....</b>	<b>5</b>
<b>1.1</b>	<b>COMPLEMENTARY MATERIALS.....</b>	<b>5</b>
<b>2</b>	<b>TEST SITES.....</b>	<b>6</b>
<b>2.1</b>	<b>TEST FACILITIES .....</b>	<b>6</b>
<b>2.2</b>	<b>LIST OF TEST AND MEASUREMENT INSTRUMENTS .....</b>	<b>6</b>
<b>2.3</b>	<b>TRACEABILITY .....</b>	<b>7</b>
<b>2.4</b>	<b>CALIBRATION.....</b>	<b>7</b>
<b>2.5</b>	<b>MEASUREMENT UNCERTAINTY.....</b>	<b>7</b>
<b>2.6</b>	<b>LOCATION OF ORIGINAL DATA.....</b>	<b>8</b>
<b>2.7</b>	<b>STATUS OF FACILITY USED FOR TESTING .....</b>	<b>8</b>
<b>3</b>	<b>GENERAL PRODUCT INFORMATION .....</b>	<b>9</b>
<b>3.1</b>	<b>PRODUCT FUNCTION AND INTENDED USE .....</b>	<b>9</b>
<b>3.2</b>	<b>RATINGS AND SYSTEM DETAILS.....</b>	<b>9</b>
<b>3.3</b>	<b>INDEPENDENT OPERATION MODES.....</b>	<b>10</b>
<b>3.4</b>	<b>NOISE GENERATING AND NOISE SUPPRESSING PARTS .....</b>	<b>10</b>
<b>3.5</b>	<b>SUBMITTED DOCUMENTS.....</b>	<b>10</b>
<b>4</b>	<b>TEST SET-UP AND OPERATION MODES.....</b>	<b>11</b>
<b>4.1</b>	<b>PRINCIPLE OF CONFIGURATION SELECTION .....</b>	<b>11</b>
<b>4.2</b>	<b>TEST OPERATION AND TEST SOFTWARE .....</b>	<b>11</b>
<b>4.3</b>	<b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....</b>	<b>11</b>
<b>4.4</b>	<b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE .....</b>	<b>11</b>
<b>4.5</b>	<b>TEST SETUP DIAGRAM .....</b>	<b>12</b>
<b>5</b>	<b>TEST RESULTS .....</b>	<b>14</b>
<b>5.1</b>	<b>TRANSMITTER REQUIREMENT &amp; TEST SUITES.....</b>	<b>14</b>
<i>5.1.1</i>	<i>Antenna Requirement.....</i>	<i>14</i>
<i>5.1.2</i>	<i>Maximum Peak Conducted Output Power .....</i>	<i>15</i>
<i>5.1.3</i>	<i>Conducted Power Spectral Density.....</i>	<i>16</i>
<i>5.1.4</i>	<i>6dB Bandwidth .....</i>	<i>17</i>
<i>5.1.5</i>	<i>99% Bandwidth.....</i>	<i>18</i>
<i>5.1.6</i>	<i>Conducted Spurious Emissions Measured in 100 kHz Bandwidth.....</i>	<i>19</i>
<i>5.1.7</i>	<i>Radiated Spurious Emission .....</i>	<i>20</i>
<i>5.1.8</i>	<i>Conducted Emission on AC Mains.....</i>	<i>21</i>
<b>6</b>	<b>PHOTOGRAPHS OF THE TEST SET-UP .....</b>	<b>22</b>
<b>7</b>	<b>LIST OF TABLES.....</b>	<b>22</b>

# 1 General Remarks

## 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of Bluetooth Low Energy

Appendix B: Photographs of the Test Set-up

## 2 Test Sites

### 2.1 Test Facilities

**TÜV Rheinland (Shenzhen) Co., Ltd.**

No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

### 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

<b>Radio Spectrum Testing (SRD-Tonscend)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Cal. Date</b>	<b>Cal. until</b>
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	2023-09-22	2024-09-21
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	2023-09-22	2024-09-21
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	2023-09-22	2024-09-21
DC power supply	Keysight	E3642A	MY61276100	2023-09-22	2024-09-21
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2023-09-22	2024-09-21
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2023-09-22	2024-09-21
Test Software	Tonscend	JS1120-3	N/A	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A	N/A
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-21	2025-06-20
<b>Unwanted Emission Testing (TS9975)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Cal. Date</b>	<b>Cal. until</b>
EMI Test Receiver	R&S	ESR 7	102021	2023-07-26	2024-07-25
Signal Analyzer	R&S	FSV 40	101439	2023-07-26	2024-07-25
System Controller Interface	R&S	SCI-100	S10010038	N/A	N/A
Filterbank	R&S	Wlan	100759	2023-07-26	2024-07-25
OSP	R&S	OSP 120	102040	N/A	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-07-26	2024-07-25
Amplifier	R&S	SCU-18F	180070	2023-07-26	2024-07-25
Amplifier	R&S	SCU40A	100475	2023-07-26	2024-07-25
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-07	2024-08-06

Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-07	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-28	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-08-07	2024-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-21	2025-06-20

Conducted Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102680	2025-02-22
Artificial Mains Network	R&S	ENV216	101445	2025-02-22
Artificial Mains Network	R&S	ENV432	101546	2025-02-22
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

## 2.4 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 basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

**Table 2: Measurement Uncertainty**

Parameter	Uncertainty (k=2)
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	±4.17 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB

## 2.6 Location of Original Data

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

## 2.7 Status of Facility Used for Testing

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



## 3 General Product Information

### 3.1 Product Function and Intended Use

The product is a Xiaomi Electric Scooter 5 Pro which supports Bluetooth low energy wireless technology.

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

### 3.2 Ratings and System Details

**Table 3: Technical Specification of EUT**

General Information of EUT	Value
Kind of Equipment:	Xiaomi Electric Scooter 5 Pro
Type Designation:	DDHBC50ZM
FCC ID:	2AFZZ-MHBC50ZM
IC:	25903-MHBC50ZM
HVIN:	DDHBC50ZM
PMN:	Xiaomi Electric Scooter 5 Pro
Operating Voltage:	DC 53.6@1.3A input via power adapter, or DC 46.8V(Nominal Voltage) input via internal battery
Testing Voltage:	AC 120V, 60Hz or DC 46.8V by internal battery
Operating Temperature Range:	-10 °C ~ +40 °C
AC/DC Adapter	NBW54D601D3D Input: 100-240V~, 50-60Hz, 2.0A MAX Output: 53.6V , 1.3A
Technical Specification of Bluetooth Low Energy	
Frequency Range:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK
Channel Number:	40 channels
Data Rate:	125kbps, 500kbps, 1Mbps, 2Mbps
Channel Separation:	2 MHz
Antenna Type:	Integral Antenna
Antenna Gain:	0.2 dBi (Provided by the Client)

**Table 4: RF Channel and Frequency of Bluetooth Low Energy**

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
<b>00</b>	<b>2402.00</b>	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	<b>19</b>	<b>2440.00</b>	29	2460.00	<b>39</b>	<b>2480.00</b>

Test frequencies are lowest channel: 2402 MHz, middle channel: 2440 MHz and highest channel: 2480 MHz

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Bluetooth LE transmitting mode
  - 1) Low Channel
  - 2) Middle Channel
  - 3) High Channel
- B. On, Charging Mode with BLE Connecting
- C. Off

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

### 3.5 Submitted Documents

- Application Form
- Operation Description
- PCB Layout
- User Manual
- Block Diagram
- FCC/IC Label and Location Info

## 4 Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

**Radio Spectrum:** The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model *DDHBC50ZM* in this report.

### 4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	Remark
Laptop	Lenovo	T480	S/N: PF-16A6N8
Portable Laptop	Lenovo	ThinkPad T480	S/N: 10Q67059

### 4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

## 4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

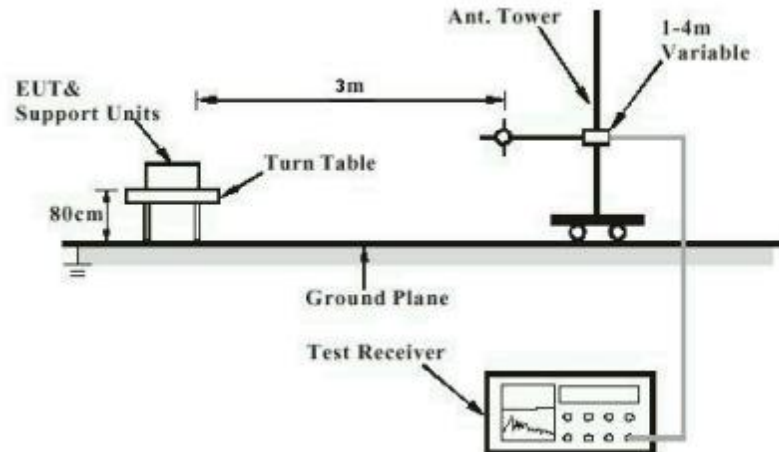
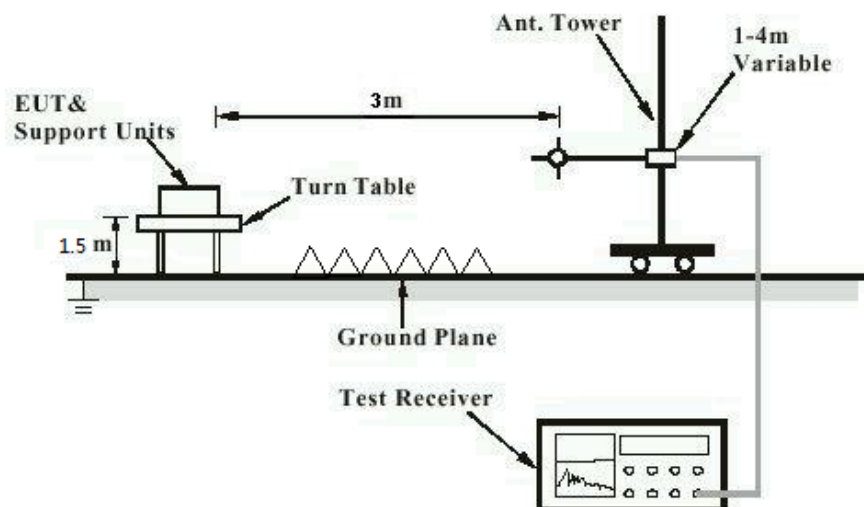
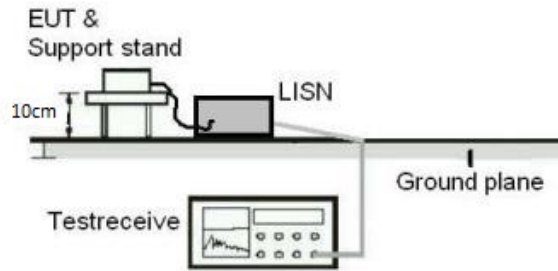


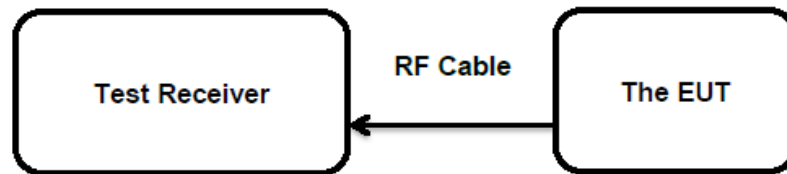
Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



**Diagram of Measurement Configuration for Mains Conduction Measurement**



**Diagram of Measurement Configuration for Conducted Transmitter Measurement**



## 5 Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.247(b)(4) and Part 15.203  
RSS-Gen Clause 6.8

According to the manufacturer declared, the EUT has an integral antenna, the gain of antenna is 0.2 dBi, which that permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

**Prüfbericht - Nr.: CN24XQRZ 002**  
*Test Report No.:*

 Seite 15 von 22  
 Page 15 of 22

### 5.1.2 Maximum Peak Conducted Output Power

**RESULT:**
**Pass**
**Test Specification**

Test standard : FCC Part 15.247(b)(3)  
                   : RSS-247 Section 5.4(d)  
 Basic standard : ANSI C63.10: 2013  
 Limits : 1.0 Watts  
 Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2024-07-15  
 Input voltage : DC 46.8V by internal battery  
 Operation mode : A  
 Test channel : Low / Middle / High  
 Ambient temperature : 25 °C  
 Relative humidity : 45 %  
 Atmospheric pressure : 101 kPa

**Table 6: Test Result of Maximum Peak Conducted Output Power**

Test Mode	Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
			(dBm)	(W)	
Bluetooth Low Energy	1 Mbps	2402	-0.50	0.0009	< 1.0
		2440	-0.48	0.0009	
		2480	-1.16	0.0008	
	2 Mbps	2402	-0.59	0.0009	
		2440	-0.48	0.0009	
		2480	-1.10	0.0008	
	125 kbps	2402	-0.39	0.0009	
		2440	-0.22	0.0010	
		2480	-0.84	0.0008	
	500 kbps	2402	-0.35	0.0009	
		2440	-0.25	0.0009	
		2480	-0.97	0.0008	
<b>Maximum Measured Value</b>			<b>-0.22</b>	<b>0.0010</b>	
Max. e.i.r.p.=-0.22dBm+0.2dBi=-0.02dBm, which is less than 36dBm=4W.					

Note:

- 1) The cable loss is taken into account in results.
- 2) Antenna gain(G): 0.2 dBi  
 $e.i.r.p.=P_{(Peak\ power)}+G$ , which is far below the 4 W

Prüfbericht - Nr.: **CN24XQRZ 002**  
Test Report No.:Seite 16 von 22  
Page 16 of 22

### 5.1.3 Conducted Power Spectral Density

**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.247(e)  
RSS-247 Section 5.2(b)

Basic standard : ANSI C63.10: 2013

Limits : < 8 dBm / 3kHz

Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2024-07-15

Input voltage : DC 46.8V by internal battery

Operation mode : A

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 45 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix A.



### 5.1.4 6dB Bandwidth

**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 15.247(a)(2) RSS-247 Section 5.2(a)
Basic standard	: ANSI C63.10: 2013
Limits	: > 500 KHz
Kind of test site	: Shielded Room

**Test Setup**

Date of testing	: 2024-07-15
Input voltage	: DC 46.8V by internal battery
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 45 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

**Prüfbericht - Nr.: CN24XQRZ 002**  
Test Report No.:Seite 18 von 22  
Page 18 of 22

### 5.1.5 99% Bandwidth

**RESULT:****Pass****Test Specification**

Test standard : RSS-Gen Clause 6.7  
Basic standard : ANSI C63.10: 2013  
Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2024-07-15  
Input voltage : DC 46.8V by internal battery  
Operation mode : A  
Test channel : Low / Middle / High  
Ambient temperature : 25 °C  
Relative humidity : 45 %  
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix A.

Prüfbericht - Nr.: **CN24XQRZ 002**  
Test Report No.:Seite 19 von 22  
Page 19 of 22

## 5.1.6 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 15.247(d) RSS-247 Section 5.5
Basic standard	: ANSI C63.10: 2013
Limits	: 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	: Shielded Room

**Test Setup**

Date of testing	: 2024-07-15
Input voltage	: DC 46.8V by internal battery
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 25 °C
Relative humidity	: 45 %
Atmospheric pressure	: 101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix A.

Prüfbericht - Nr.: **CN24XQRZ 002**  
Test Report No.:Seite 20 von 22  
Page 20 of 22

## 5.1.7 Radiated Spurious Emission

**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.247(d) & FCC Part 15.205  
RSS-247 Section 3.3

Basic standard : ANSI C63.10: 2013

Limits : Refer to 15.209(a) of FCC part 15.247(d)  
RSS-Gen Section 8.9 & 8.10

Kind of test site : 3m Semi-anechoic Chamber

**Test Setup**

Date of testing : 2024-07-22 to 2024-07-23

Input voltage : DC 46.8V by internal battery

Operation mode : A

Test channel : Low / Middle / High

Ambient temperature : Refer to test result

Relative humidity : Refer to test result

Atmospheric pressure : 101 kPa

**Remark:**

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A.

Prüfbericht - Nr.: **CN24XQRZ 002**  
Test Report No.:Seite 21 von 22  
Page 21 of 22

### 5.1.8 Conducted Emission on AC Mains

**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.207(a)  
RSS-Gen Section 8.8

Basic standard : ANSI C63.10: 2013

Frequency range : 0.15 – 30MHz

Limits : FCC Part 15.207(a)  
RSS-Gen Table 4

Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2024-06-28

Input voltage : AC 120V, 60Hz

Operation mode : B

Earthing : Not connected

Ambient temperature : 23.4 °C

Relative humidity : 51.2 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix A.

## 6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix B.

## 7 List of Tables

Table 1: List of Test and Measurement Equipment.....	6
Table 2: Measurement Uncertainty .....	7
Table 3: Technical Specification of EUT.....	9
Table 4: RF Channel and Frequency of Bluetooth Low Energy .....	10
Table 5: List of Accessories and Auxiliary Equipment.....	11
Table 6: Test Result of Maximum Peak Conducted Output Power .....	15