Prüfbericht - Produkte
Test Report - Products

TÜVRheinland®

Prüfbericht-Nr.: *Test report no.:*	**60379462 016**	**Auftrags-Nr.:** *Order no.*:	168324514	Seite 1 von 13 *Page 1 of 13*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2021-06-28	
Auftraggeber: *Client:*	**Amazon.com Services LLC** 410 Terry Ave N, Seattle, Washington 98109, United States Of America			
Prüfgegenstand: *Test item:*	AMAZON LOCKER			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	ZL-ODIN-V1			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart B ICES-003 Issue 7 October 2020			

Wareneingangsdatum: *Date of sample receipt:*	2021-07-09
Prüfmuster-Nr.: *Test sample no:*	A003001363-001,002
Prüfzeitraum: *Testing period:*	2021-07-12 – 2021-09-06
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

geprüft von: *tested by:*	Lin Lin	**genehmigt von:** *authorized by:*	Hardy Suo
Datum: *Date:* 2021-09-09		**Ausstellungsdatum:** *Issue date:* 2021-09-09	
Stellung / *Position:*	Senior Project Manager	**Stellung** / *Position:*	Reviewer

Sonstiges / *Other:* Note: This report based on the 60379461 012 adding addtional license radio module, due to this changed, all the EMC arranged re-test.

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

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

V05

Test Summary

5.1.1 RADIATED EMISSIONS
RESULT: Pass

5.1.2 CONDUCTED EMISSIONS ON AC MAINS
RESULT: Pass

Contents

1 GENERAL REMARKS 4
1.1 COMPLEMENTARY MATERIALS 4
2 TEST SITES 5
2.1 TEST FACILITIES 5
2.2 LIST OF TEST AND MEASUREMENT INSTRUMENTS 5
2.3 TRACEABILITY 6
2.4 CALIBRATION 6
2.5 MEASUREMENT UNCERTAINTY 6
2.6 LOCATION OF ORIGINAL DATA 6
2.7 STATUS OF FACILITY USED FOR TESTING 6
3 GENERAL PRODUCT INFORMATION 7
3.1 PRODUCT FUNCTION AND INTENDED USE 7
3.2 RATINGS AND SYSTEM DETAILS 7
3.3 INDEPENDENT OPERATION MODES 8
3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS 8
3.5 SUBMITTED DOCUMENTS 8
4 TEST SET-UP AND OPERATION MODES 9
4.1 PRINCIPLE OF CONFIGURATION SELECTION 9
4.2 TEST OPERATION AND TEST SOFTWARE 9
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT 9
4.4 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE 9
4.5 TEST SETUP DIAGRAM 10
5 TEST RESULTS 11
5.1.1 Radiated Emissions 11
5.1.2 Conducted Emissions on AC Mains 12
6 PHOTOGRAPHS OF THE TEST SET-UP 13
7 LIST OF TABLES 13

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 Setup Photos

Appendix B: Test results of EMC (07 version).

Appendix C: Test results of EMC (08 version).

Appendix D: Test results of EMC (09 version).

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of 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

Radiated Emissions (10m chamber)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
10m modified SAC	ETS	SAC10	CT001632-Q1399	2024-03-01
EMI Test Receiver	R&S	ESR7	102022	2022-08-10
EMI Test Receiver	R&S	ESR7	102023	2022-08-10
Bilog Antenna	TESEQ	CBL6112D	51321	2022-08-08
Bilog Antenna	TESEQ	CBL6112D	51322	2022-07-11
Preamplifier	SCHWARZBECK	BBV9745	115	2022-08-13
Preamplifier	EMCI	EMC9135-P	980629	2022-08-13
Preamplifier	FIT	SCU-18F	180076	2022-08-13
Horn Antenna	R&S	HF907	102707	2022-07-10
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A
Conducted Emissions				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
EMI Test Receiver	R&S	ESR3	102428	2022-08-10
Artificial Mains Network	R&S	ENV216	102333	2022-08-10
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 basics 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.

Parameter	Uncertainty
Radiated Emission (10m SAC), 30MHz to 1000MHz	± 4.66 dB
Radiated Emission (10m SAC), above 1000MHz	± 4.35 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 & C & D 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 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of 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 EUT is an Amazon Locker which supports Bluetooth LE, GPRS/EGPRS/eMTC/NB-IoT functions.

Note: This product contains transmitter module.
Contains FCC ID：XMR201910BG95M3
Contains IC: 10224A-2019BG95M3

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

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	AMAZON LOCKER
Type Designation	ZL-ODIN-V1
FCC ID	2AWCC-5677
IC	24273-5677
HVIN	ZL-ODIN-V1
Battery Specification	Model: 26S1024 Nominal Voltage: 6Vdc Typical Capacity: 40.8Ah
AC/DC adapter:	Model: GST18A07 Input: 100-240Vac, 50/60Hz Output: 7.5Vdc, 2A
Testing Voltage	6Vdc
Work Temperature	-20°C ~ +55°C
Equipment Class	Class B
Bluetooth	
Bluetooth Version:	V5.0
Frequency Range:	2402-2480MHz
Type of Modulation:	GFSK
Data Rate:	1Mbps
Quantity of Channels	40
Channel Separation:	2MHz
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	2.1dBi
GPRS/EGPRS	
Wireless Technology:	GPRS, EGPRS
Operation Frequency band(s)	GPRS/EGPRS: 850/1900
Power Class:	GPRS 850: Class 4 GPRS1900: Class 1 EGPRS 850/1900: E2
GPRS Class	Multi-slot:33
EGPRS Class	Multi-slot:33
Type of Modulation:	GPRS: GMSK EGPRS: GMSK, 8PSK

Channel separation	200KHz
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	3.8dBi
HW version:	R2.1
SW version:	BG95M3LAR02A03
eMTC	
Wireless Technology:	eMTC
Operation Frequency band(s)	Band 2/4/5/12/13/25/26/66/85
Power Class:	Class 5
Type of Modulation:	QPSK, 16QAM
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	3.8dBi
HW version:	R2.1
SW version:	BG95M3LAR02A03
NB-IoT	
Wireless Technology:	NB-IoT
Operation Frequency band(s)	Band 2/4/5/12/13/25/66/71/85
Power Class:	Class 5
Type of Modulation:	BPSK, QPSK
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	3.8dBi
HW version:	R2.1
SW version:	BG95M3LAR02A03

3.3 Independent Operation Modes

The basic operation modes are:

A. Normal operation (AC/DC adapter operated)
   1. Bluetooth link + GPRS/EGPRS link + Normal operation + LED on
   2. Bluetooth link + eMTC link + Normal operation + LED on
   3. Bluetooth link + NB-IoT link + Normal operation + LED on

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Block Diagram
- Schematics
- User Manual
- Rating Label

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

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 C63.4: 2014.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Mobile	HUAWEI	STK-AL00	N/A

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)

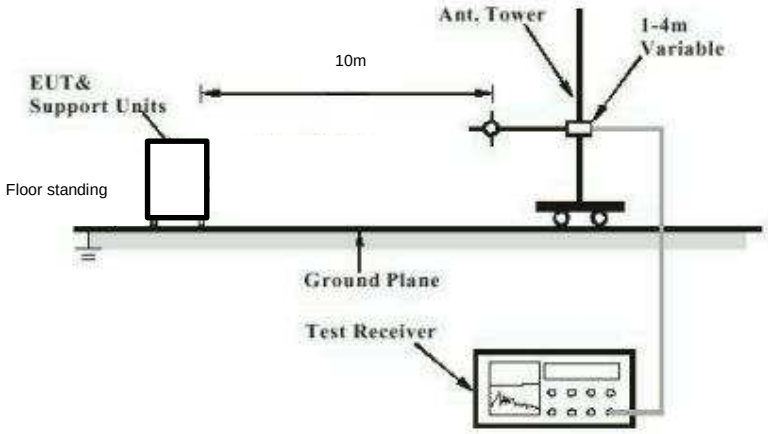


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

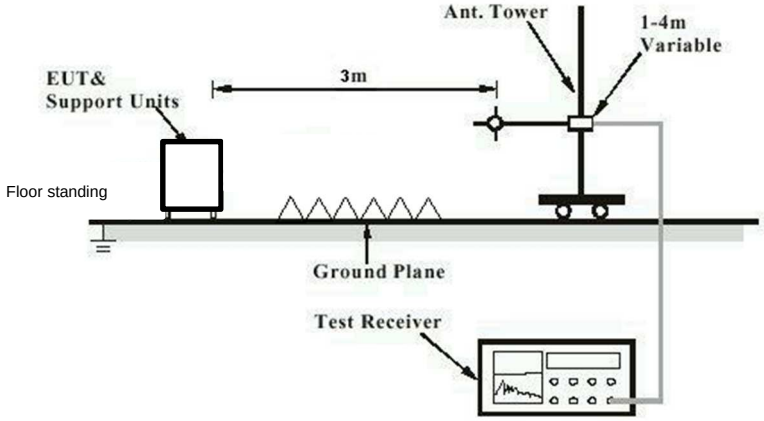
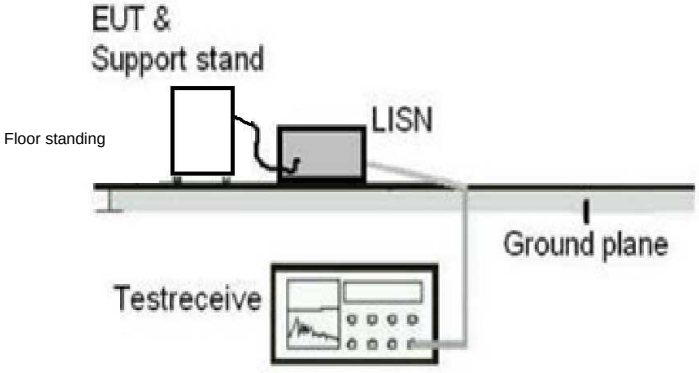


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



5 Test Results

5.1.1 Radiated Emissions

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.109(a) ICES-003 Issue 7, Clause 3.2.2
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	30MHz to 5th highest fundamental frequency
Classification	:	Class B
Limits	:	FCC Part 15.109(a) ICES-003 Issue 7, Clause 3.2.2
Kind of test site	:	10m Semi-anechoic Chamber & 10m Full-anechoic Chamber

Test Setup

Date of testing	:	2021-07-15 ~ 2021-09-03
Input voltage	:	AC 120V/60Hz
Operation mode	:	A
Earthing	:	Connected
Ambient temperature	:	23 ℃
Relative humidity	:	51 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B & C & D.

5.1.2 Conducted Emissions on AC Mains

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.107(a) ICES-003 Issue 7, Clause 3.2.1
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	150KHz to 30MHz
Classification	:	Class B
Limits	:	FCC Part 15.109(a) ICES-003 Issue 7, Clause 3.2.1
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2021-07-21 ~ 2021-09-01
Input voltage	:	AC 120V/60Hz
Operation mode	:	A
Earthing	:	Connected
Ambient temperature	:	23 ℃
Relative humidity	:	51 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B & C & D.

6 Photographs of the Test Set-Up

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

7 List of Tables

Table 1: List of Test and Measurement Equipment 5
Table 2: Technical Specification of EUT 7
Table 3: List of Accessories and Auxiliary Equipment 9