

Prüfbericht-Nr.: <i>Test report no.:</i>	60379462 011	Auftrags-Nr.: <i>Order no.:</i>	168310149	Seite 1 von 14 Page 1 of 14
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-03-17	
Auftraggeber: <i>Client:</i>	Amazon.com Services LLC 410 Terry Ave N, Seattle, Washington 98109, United States Of America			
Prüfgegenstand: <i>Test item:</i>	AMAZON LOCKER			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	ZL-ODIN-V1			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart B ICES-003 Issue 7 October 2020			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-03-29	Refer to photo documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003001363-001,002			
Prüfzeitraum: <i>Testing period:</i>	2021-04-01 – 2021-04-30			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	 Lin Lin		genehmigt von: <i>authorized by:</i>	 Sam Lin
Datum: <i>Date:</i>	2021-05-07		Ausstellungsdatum: <i>Issue date:</i>	2021-05-07
Stellung / Position:	Senior Project Manager		Stellung / Position:	Technical Certifier
Sonstiges / Other:	This version of ZL-ODIN-V1 based on the report 60379462 008, the PCB layout of product (power management board and control board) with minor changed and the other not changed, including product size, wireless technology and configuration, detail refer to C2PC letter, due to these changed, the whole product is arranged a fully EMC test.			
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 N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient 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>				

v05

Test Summary

5.1.1 RADIATED EMISSIONS

RESULT: Pass

5.1.2 CONDUCTED EMISSIONS ON AC MAINS

RESULT: Pass

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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 FCC 15B & ICES-003

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	2021-08-31
EMI Test Receiver	R&S	ESR7	102022	2021-08-16
EMI Test Receiver	R&S	ESR7	102023	2021-08-16
Bilog Antenna	TESEQ	CBL6112D	51321	2022-08-07
Bilog Antenna	TESEQ	CBL6112D	51322	2022-07-10
Preamplifier	SCHWARZBECK	BBV9745	115	2021-08-16
Preamplifier	EMCI	EMC9135-P	980629	2021-08-16
Preamplifier	FIT	SCU-18F	180076	2021-08-16
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	2021-08-16
Artificial Mains Network	R&S	ENV216	102333	2021-08-16
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.

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 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 and NB-IoT functions.

Note: This product contains transmitter module.

Contains FCC ID : XMR201707BG96

Contains IC: 10224A-201709BG96

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
Powered by	1. Internal Battery 2. or AC/DC converter
Battery Specification	Model: 26S1024 Nominal Voltage: 6Vdc Typical Capacity: 40.8Ah
AC/DC converter	Input: 100-240Vac, 50/60Hz
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 900: Class 4 GPRS1800: Class 1 EGPRS 900/1800: E2
GPRS Class	Multi-slot:12

EGPRS Class	Multi-slot:12
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:	R1.0
SW version:	BG96MAR02A02M1G
eMTC	
Wireless Technology:	eMTC
Operation Frequency band(s)	Band 2/4/5/12/13/26
Power Class:	Class 3
Type of Modulation:	QPSK, 16QAM
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	3.8dBi
HW version:	R1.0
SW version:	BG96MAR02A02M1G
NB-IoT	
Wireless Technology:	NB-IoT
Operation Frequency band(s)	Band 2/5/12/13/26
Power Class:	Class 3
Type of Modulation:	BPSK, QPSK
Type of Antenna:	External Antenna
Antenna number:	1
Antenna Gain:	3.8dBi
HW version:	R1.0
SW version:	BG96MAR02A02M1G

3.3 Independent Operation Modes

The basic operation modes are:

- A. Normal operation (Internal battery 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
- B. Normal operation (AC/DC converter operated)
 - 4. Bluetooth link + GPRS/EGPRS link + Normal operation + LED on
 - 5. Bluetooth link + eMTC link + Normal operation + LED on
 - 6. 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)

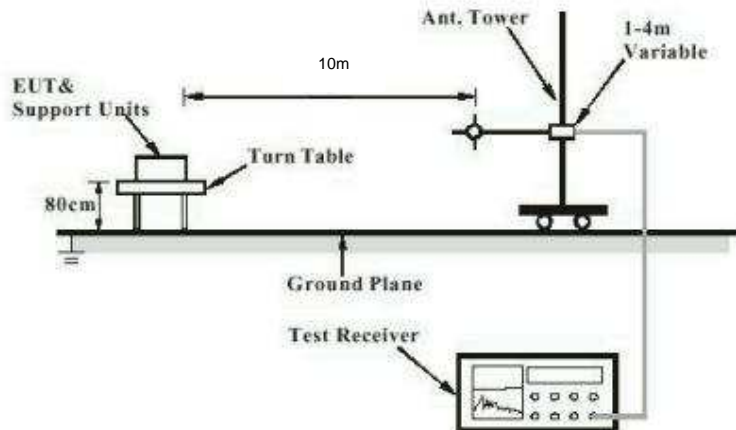


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

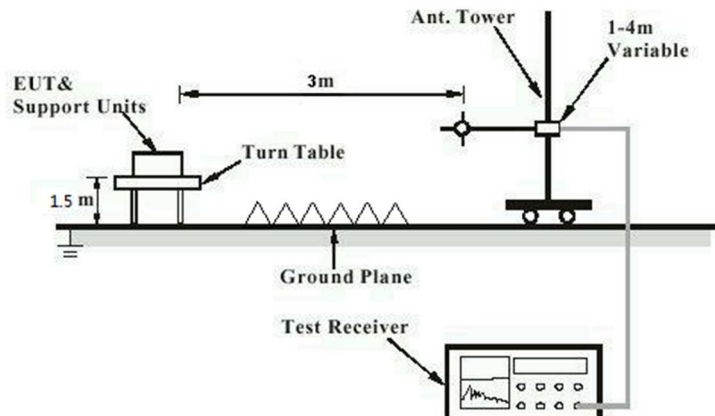
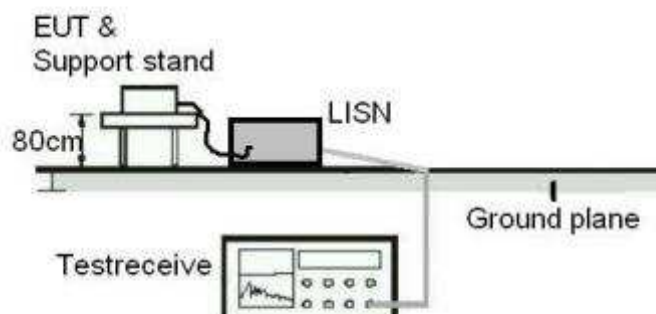


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



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 5 th 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	: 2021-04-08 ~ 2021-04-29
Input voltage	: AC 120V/60Hz or Battery operation
Operation mode	: A, B
Earthing	: Connected
Ambient temperature	: 23 °C
Relative humidity	: 51 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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	: 2021-04-25
Input voltage	: AC 120V/60Hz
Operation mode	: B
Earthing	: Connected
Ambient temperature	: 23 °C
Relative humidity	: 51 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

6 Photographs of the Test Set-Up

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

7 List of Tables

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