

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21VQW2 003	Auftrags-Nr.: <i>Order no.:</i>	168313547	Seite 1 von 13 Page 1 of 13	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-05-06		
Auftraggeber: <i>Client:</i>	Chengdu TD Tech Ltd. 3-5/F, C Area, Tianfu Software Park, 219# Tianhua 2nd Road, Gaoxin District, Chengdu 610041 Sichuan, P.R. China				
Prüfgegenstand: <i>Test item:</i>	Data Terminal				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	eCube-CP-AU, eCube-CG-AU				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart B				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-04-12	Refer to Photo Documentation			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003028673-003				
Prüfzeitraum: <i>Testing period:</i>	2021-04-13 – 2021-06-03				
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>	genehmigt von: <i>authorized by:</i>				
Datum: <i>Date:</i>	2021-06-15	Ausstellungsdatum: <i>Issue date:</i>	2021-06-15		
Stellung / Position:	Senior Project Manager	Stellung / Position:	Technical Certifier		
Sonstiges / Other:	FCC ID: 2AZ2H-ECUBE-AU				
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 F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft 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 F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	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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Test Summary

5.1.1 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

5.1.2 RADIATED EMISSIONS

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: Photographs of the Test Set-up

Appendix B: Test Results of FCC 15B

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

Conducted Emission				
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
Impedance Stabilisation Network	R&S	ENY81	100323	2021-08-16
Impedance Stabilisation Network	R&S	ENY81-CA6	101810	2021-08-16
Artificial Mains Network	R&S	ENV216	102333	2021-08-16
Radiated Emission (3m chamber)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
3m SAC	ETS	SAC3	CT001632-Q1362	2021-08-23
EMI Test Receiver	R&S	ESR7	102111	2021-12-16
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier	FIT	SCU-18F	180077	2021-08-16
Active magnetic loop antenna	SCHWARZBECK	FMZB1519B	00080	2021-08-20
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2021-12-16
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 (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 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 eCube-CP-AU, eCube-CG-AU are subscriber equipment in the Bluetooth LE /GSM/WCDMA/LTE system. The GSM frequency bands include GSM850 and PCS1900. The UMTS frequency band includes band II and band V. The LTE frequency bands include band 2, band 4 and band 7.

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:	Data Terminal	
Type Designation:	eCube-CP-AU, eCube-CG-AU Note: the eCube-CP-AU is selected to test as master device.	
Difference between the eCube-CP-AU and eCube-CG-AU:	Model	Ports
	eCube-CP-AU	2x RS232 (with RTS/CTS) 1x RS485 (WAGO) 4x Fast Ethernet 1x USB 2.0 host port 1x FXS port 1x Main 4G antenna port 1x Auxiliary 4G antenna port 1x SIM card slot
	eCube-CG-AU	1x RS232 (with RTS/CTS) 1x RS485 (WAGO) 2x Fast Ethernet 1x USB 2.0 host port 1x Main 4G antenna port 1x Auxiliary 4G antenna port 1x SIM card slot
	Note: the hardware design (including PCB layout, Circuit diagram, radio configuration, software and firmware) of the above two product are the same, only difference on the external ports.	
FCC ID:	2AZ2H-ECUBE-AU	
Hardware Version:	eCube-CP-AU: eCube-CP-V4.2 eCube-CG-AU: eCube-CG-V4.2	
Software Version:	V100R001C00	
Operating Temperature Range:	-10°C ~ +50°C	
Operating Voltage	12Vdc, Power by AC/DC Adapter	
Testing Voltage	AC 120V, 60Hz	

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Normal operation

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|---|--|
| ☒ User Manual | ☒ Rating Label |
| ☒ Circuit Diagram | ☒ PCB Layout |
| ☒ Block Diagram | ☒ Photo Document |
| ☒ Schematics | ☒ Parts List |
| ☒ Model Difference Letter | |

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: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Remark
Laptop	Lenovo	T480	PF-180KTA 18/07	N/A
Personal Computer	Lenovo	ThinkCenter M910t	M70760G2	N/A
Telephone	N/A	N/A	TUVR-008_AS	N/A
Power adapter	FUHUA	DYS865-120500W	N/A	Input: 100-240V ~ 50/60Hz Output: 12.0V, 5.0A

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)

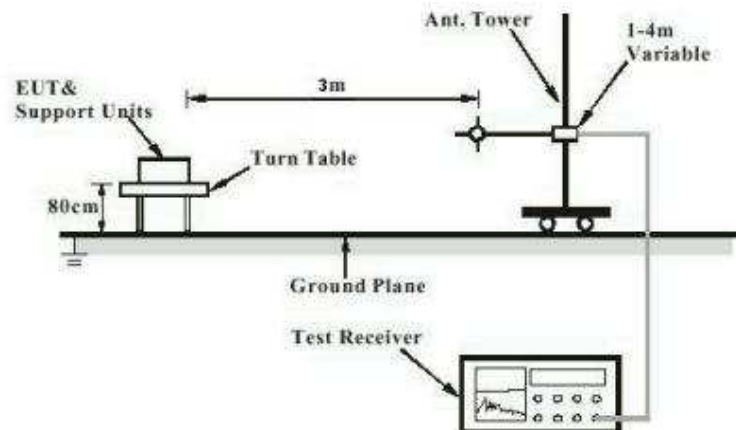


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

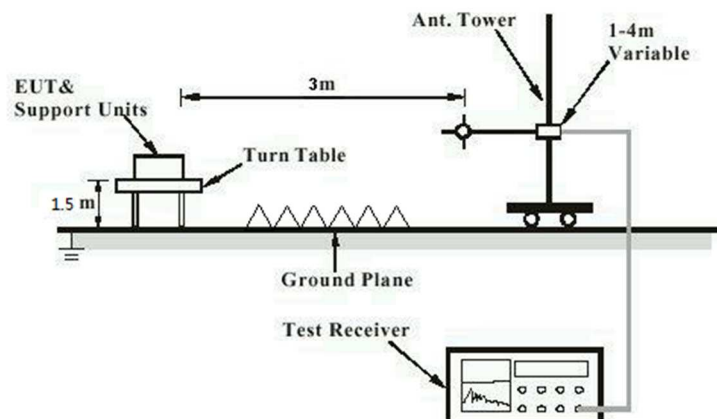
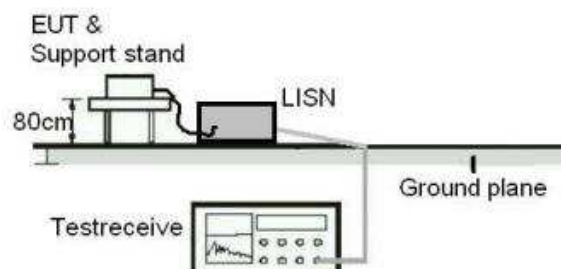


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1.1 Conducted Emission on AC Mains

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

Test standard	: FCC Part 15.107(a)
Basic standard	: ANSI C63.4:2014
Frequency range	: 0.15 – 30MHz
Classification	: Class B
Limits	: FCC Part 15.107(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2021-04-23 ~ 2021-04-27
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 23.1 °C
Relative humidity	: 52 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

5.1.2 Radiated Emissions

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

Test standard	: FCC Part 15.109(a)
Basic standard	: ANSI C63.4:2014
Frequency range	: 30MHz to 5 th harmonic of the highest frequency
Classification	: Class B
Limits	: FCC Part 15.109(a)
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2021-04-26
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 23 °C
Relative humidity	: 50 %
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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