

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22S7CP 001	Auftrags-Nr.: <i>Order no.:</i>	168362165	Seite 1 von 18 Page 1 of 18
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-03-08	
Auftraggeber: <i>Client:</i>	ATECH Automotive (Wuhu) Co., Ltd. No. 48, Yinhu North Road, Wuhu District China (Anhui) Pilot Free Trade Zone, Wuhu City, Anhui Province, China			
Prüfgegenstand: <i>Test item:</i>	LOTUS EMIRA Key Fob			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	T131 (Tradename: Lotus Cars)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.231 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 2: Subpart J Section 2.1093		RSS-210 Issue 10 RSS-Gen Issue 5	
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-04-14	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003222255-007			
Prüfzeitraum: <i>Testing period:</i>	2022-04-16 - 2022-06-23			
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>	X 		genehmigt von: <i>authorized by:</i>	X 
Datum: <i>Date:</i> 2023-12-05	Signed by: Breeze Jiang		Ausstellungsdatum: <i>Issue date:</i> 2023-12-05	Signed by: Lin Lin
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / <i>Other:</i>	FCC ID: 2A8K9T131 IC: 29234-T131 HVIN: T131			
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: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * 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				
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Anmerkungen
Remarks

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4	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. <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>

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 DEACTIVATION OF THE TRANSMISSION

RESULT: Pass

5.1.3 20dB BANDWIDTH

RESULT: Pass

5.1.3 99% BANDWIDTH

RESULT: Pass

5.1.5 FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

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.

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 Registration No.: 694916

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Unwanted Emission Testing (TS9975)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09
Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

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.

Item		Extended Uncertainty
Radiated Emission (30-1000MHz)	Field strength (dBμV/m)	±6 dB
Radiated Emission (above 1000MHz)	Field strength (dBμV/m)	±6 dB
Radio Spectrum		± 2.5 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) 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 a LOTUS EMIRA Key Fob for vehicular use.

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	LOTUS EMIRA Key Fob
Type Designation	T131
FCC ID	2A8K9T131
IC	29234-T131
Extreme Temperature Range	-40°C - +85°C
Operating Voltage	DC 3V (Powered by a new Battery)
Testing Voltage	New battery
Technical Specification	
Frequency Range	433.66MHz, 434.18MHz
Type of Modulation	FSK
Channel Number	2 channel
Antenna Type	Integral Antenna

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Transmitting mode (RTE, KV)
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- User Manual

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.

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.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model T131 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Notebook PC	Lenovo	T480	PF-16A6N8

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)

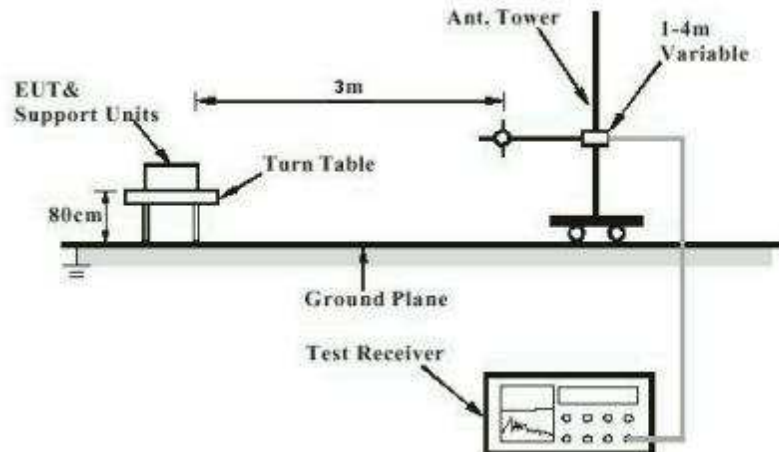


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

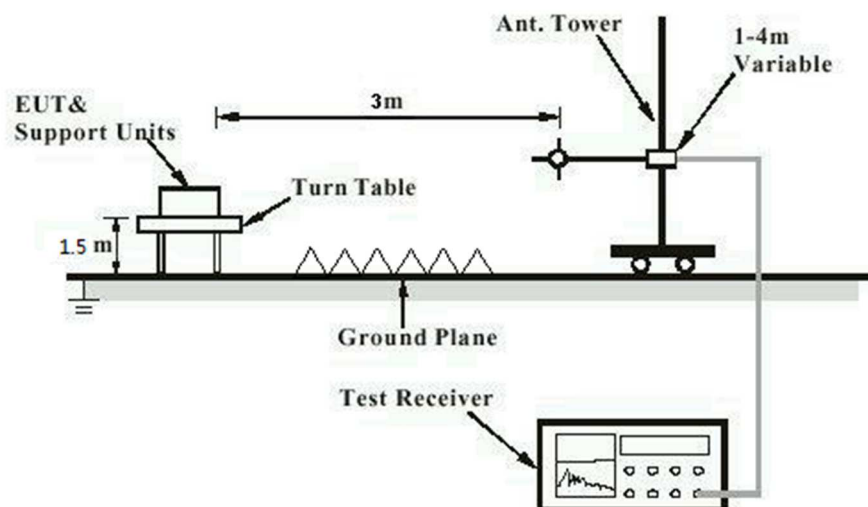
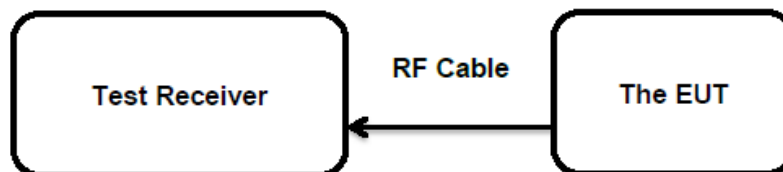


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

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

Test standard	:	Part 15.203
	:	RSS-Gen Clause 6.7
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0 dBi, and the antenna connector is designed with 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.

5.1.2 Deactivation of the Transmission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.231 a (1) RSS-Gen Issue 5
Basic standard	: ANSI C63.10: 2013
Limit	: FCC Part 15.231 a (1)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-4-26
Input voltage	: New battery
Operation mode	: A
Ambient temperature	: 25 °C
Relative humidity	: 53 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

5.1.3 20dB Bandwidth

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

Test standard : FCC Part 15.231 a (c)
RSS-Gen Issue 5

Basic standard : ANSI C63.10: 2013

Limit : FCC Part 15.231 a (c)

Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-4-26

Input voltage : New battery

Operation mode : A

Ambient temperature : 25 °C

Relative humidity : 53 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B, pre-test both RKE and KV mode, only the worst case RKE was recorded.

5.1.4 99% Bandwidth

RESULT:

Pass

Test Specification

Test standard : RSS-Gen Clause 6.6
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-4-26
Input voltage : New battery
Operation mode : A
Ambient temperature : 25 °C
Relative humidity : 53 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B, pre-test both RKE and KV mode, only the worst case RKE was recorded.

5.1.5 Field strength of fundamental and Unwanted Emissions in the Spurious Domain

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

Test standard	FCC Part 15.231(b) (1)(2)(3) FCC Part 15.205 FCC Part 15.209 RSS-Gen Issue 5 RSS-210 Issue 10
Basic standard	ANSI C63.10: 2013
Limits	FCC Part 15.231(b)
Kind of test site	3m Semi-anechoic Chamber

Test Setup

Date of testing	2022-4-16
Input voltage	New battery
Operation mode	A
Ambient temperature	Refer to test result
Relative humidity	Refer to test result
Atmospheric pressure	101 kPa

For the measurement records, refer to the appendix B, pre-test both RKE and KV mode, only the worst case RKE was recorded.

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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