



TEST REPORT

Report No.: SHATBL2410006W04

Applicant : Shanghai Mini Deer Robot Co., LTD.

Product Name : GNSS RECEIVER



Model Name : R70 Smart

FCC ID : 2BKEC-R70SMART

Test Standard : FCC 47 CFR Part 2.1091

Date of Test : 2024.10.19-2025.03.21

Report Prepared by :

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(Emily)



Report Approved by :

Guozheng Li

(Guozheng Li)

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(Terry Yang)

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TABLE OF CONTENTS

TEST REPORT	1
TABLE OF CONTENTS	2
REVISION HISTORY	3
DECLARATION OF REPORT	4
1. GENERAL DESCRIPTION	5
1.1. Applicant	5
1.2. Manufacturer	5
1.3. Factory	5
1.4. General Information of EUT	6
1.5. Equipment Specification	6
1.6. Modification of EUT	7
1.7. Laboratory Information	7
1.8. Applicable Standards	7
2. FCC 47CFR §2.1091 Requirement	8
2.1. Test Standards	8
2.2. Limit	8
2.3. MPE Calculation Method	9
2.4. Manufacturing Tolerance	9
2.5. Test Result	10

REVISION HISTORY

Rev.	Issue Date	Revisions	Revised by
00	2025.03.24	Initial Release	Guozheng Li

DECLARATION OF REPORT

1. The device has been tested by ATBL, and the test results show that the equipment under test (EUT) is in compliance with the requirements of 47 CFR Part 2.1091. And it is applicable only to the tested sample identified in the report.
2. This report shall not be reproduced except in full, without the written approval of ATBL, this document only be altered or revised by ATBL, personal only, and shall be noted in the revision of the document.
3. The general information of EUT in this report is provided by the customer or manufacture, ATBL is only responsible for the test data but not for the information provided by the customer or manufacture.
4. The results in this report is only apply to the sample as tested under conditions. The customer or manufacturer is responsible for ensuring that the additional production units of this model have the same electrical and mechanical components.

1. GENERAL DESCRIPTION

1.1. Applicant

Name : Shanghai Mini Deer Robot Co., LTD.

Address : Room 505, Building No.1,Lane 215,Gaoguang Road, Qingpu District,Shanghai,China

1.2. Manufacturer

Name : Shanghai Mini Deer Robot Co., LTD.

Address : Room 505, Building No.1,Lane 215,Gaoguang Road, Qingpu District,Shanghai,China

1.3. Factory

Name : Shanghai Mini Deer Robot Co., LTD.

Address : Room 505, Building No.1,Lane 215,Gaoguang Road, Qingpu District,Shanghai,China

1.4. General Information of EUT

General Information	
Equipment Name	GNSS RECEIVER
Brand Name	 Mini Deer Robot
Model Name	R70 Smart
Series Model	/
Model Difference	/
Sample No.	202400812007004
UE Capabilities	UE Category 1
Power Input	DC 9-36V
Adapter	/
Battery	/
Hardware Version	1.020
Software Version	R70E_2.6.0_240418
Operating Temperature Range	-45°C ~ +75°C
Connecting I/O Port(s)	Refer to the remark below.

Remark:

The above information of EUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.5. Equipment Specification

Equipment Specification		
	WWAN	LTE
Antenna Information	Antenna Type	FPC
	Antenna Gain	Band 2 : 1 dBi Band 4: 1 dBi Band 5: 0 dBi Band 7: -5.5 dBi Band 38: -5.5 dBi Band 41: -5.5 dBi

1.6. Modification of EUT

No modifications are made to the EUT during all test items.

1.7. Laboratory Information

Company Name	:	Shanghai ATBL Technology Co., Ltd.
Address	:	Building 8, No.160 Basheng Road, Waigaoqiao Free Trade Zone, Pudong New Area, Shanghai
Telephone	:	+86(0)21-51298625
The FCC Registration Number (FRN)	:	0031025281
A2LA Number	:	6184.01
CNAS Number	:	CNAS L14531
CAB Identifier	:	CN0116

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Standard	Description
47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
47 CFR Part 22	Public Mobile Services (Cellular Band 5: 824-849 MHz)
47 CFR Part 24	Personal Communications Services (PCS Band 2: 1850-1910 MHz; AWS Band 4: 1710-1755 MHz)
47 CFR Part 27	Miscellaneous Wireless Communications Services (IMT-Advanced Bands 7: 2500-2690 MHz, 38: 2570-2620 MHz, 41: 2496-2690 MHz)
47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
KDB 447498 D01 V06	Rf Exposure Procedures And Equipment Authorization Policies For Mobile And Portable Devices

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2. FCC 47CFR §2.1091 Requirement

2.1. Test Standards

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

KDB447498 D01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

2.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

2.3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

2.4. Manufacturing Tolerance

Function	Target (dBm)	Tolerance \pm (dB)
LTE Band2	23.00	1.00
LTE Band4	24.00	1.00
LTE Band5	24.00	1.00
LTE Band7	22.00	1.00
LTE Band38	24.00	1.00
LTE Band41	24.00	1.00

Note: The target power has included the maximum transmission power and tolerance values.

2.5. Test Result

As declared by the Applicant, the EUT is a wireless device used in a Mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r = 20\text{cm}$, as well as the gain of the used antenna is refer to section 4, the RF power density can be obtained.

Modulation Type	Output power (Target)		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
LTE Band2	24.00	251.19	1	1.259	0.0629	1.0000
LTE Band4	25.00	316.23	1	1.259	0.0792	1.0000
LTE Band5	25.00	316.23	0	1.000	0.0629	0.5493
LTE Band7	23.00	199.53	-5.5	0.282	0.0112	1.0000
LTE Band38	25.00	316.23	-5.5	0.282	0.0177	1.0000
LTE Band41	25.00	316.23	-5.5	0.282	0.0177	1.0000

Note:

1. If nothing else, the report will only record the worst power.
2. The Maximum power is less than the limit, complies with the exemption requirements.
3. Output power (AVG) including turn-up tolerance;
4. The calculated distance is 20 cm.

*****END OF THE REPORT*****