

Radio Test Report

Report No.: STS2308119H01

Issued for

Shanghai AllyNav Technology Co.,Ltd.

Room 201, Buliding 1, No 215, Gaoguang RD, Qingpu
District, Shanghai, China

Product Name: GNSS Receiver

Brand Name: N/A

Model Name: R61

Series Model(s): N/A

FCC ID: 2AT4H -R61

Test Standard: FCC 47CFR §2.1091

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from STS, all test data presented in this report is only applicable to presented test sample.

**TEST REPORT**

Applicant's Name : Shanghai AllyNav Technology Co.,Ltd.
Address : Room 201, Buliding 1, No 215, Gaoguang RD, Qingpu District, Shanghai, China
Manufacturer's Name : Shanghai AllyNav Technology Co.,Ltd.
Address : Room 201, Buliding 1, No 215, Gaoguang RD, Qingpu District, Shanghai, China

Product Description

Product Name : GNSS Receiver
Brand Name : N/A
Model Name : R61
Series Model(s) : N/A

Test Standards : FCC 47CFR §2.1091
447498 D04 Interim General RF Exposure Guidance v01

This report shall not be reproduced except in full, without the written approval of STS, this document only be altered or revised by STS, personal only, and shall be noted in the revision of the document.

Date of Test

Date of receipt of test item : 18 Aug. 2023
Date (s) of performance of tests : 18 Aug. 2023 ~21 Aug. 2023
Date of Issue : 21 Aug. 2023
Test Result : **Pass**

Testing Engineer :

Aaron Bu

(Aaron Bu)

Technical Manager :

Sean She

(Sean she)

Authorized Signatory :

Chris Chen

(Chris Chen)





TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 GENERAL DESCRIPTION OF THE EUT	5
1.2 TEST FACTORY	6
2. FCC 47CFR §2.1091 REQUIREMENT	7
2.1 TEST STANDARDS	7
2.2 LIMIT	7
2.3 TEST RESULT	8



Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	21 Aug. 2023	STS2308119H01	ALL	Initial Issue



1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	GNSS Receiver	
Brand	N/A	
Model Number	R61	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is GNSS Receiver	
	Operation Frequency:	LTE Band 2: 1850 MHz -1910 MHz LTE Band 4: 1710 MHz -1755 MHz LTE Band 5: 824 MHz -849 MHz LTE Band 7: 2500 MHz -2570 MHz LTE Band 12: 699 MHz -716 MHz LTE Band 13: 777 MHz -787 MHz LTE Band 25: 1850 MHz -1915 MHz LTE Band 26: 824 MHz -849 MHz LTE Band 38: 2570 MHz -2620 MHz LTE Band 41: 2496 MHz -2690 MHz LTE Band 66: 1710 MHz -1780 MHz BLE: 2400 MHz ~2483.5 MHz
	Modulation Type:	LTE: QPSK/16QAM BLE: GMSK
	Antenna gain:	LTE Band 2:1.3dBi LTE Band 4: 3.2dBi LTE Band 5:2.6 dBi LTE Band 7:4 dBi LTE Band 12:2.6 dBi LTE Band 13:2.6 dBi LTE Band 25: 1.3dBi LTE Band 26:2.6 dBi LTE Band 38: 3dBi LTE Band 41: 4dBi LTE Band 66: 3.2dBi BLE: 1.2dBi
	Antenna Designation:	BLE:GSM ANT LTE:external antenna
Rating	Input:DC15V 3A	
Adapter	Input: AC 100-240V,50/60Hz Output:DC15V 3A	
Hardware Version	R61NETV5 20221121	
Software Version	LIANSHI R61NETV2.4.4EF	



1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
LTE Band 2	AV	22±1dBm
LTE Band 4	AV	22±1dBm
LTE Band 5	AV	22±1dBm
LTE Band 7	AV	22±1dBm
LTE Band 12	AV	22±1dBm
LTE Band 13	AV	22±1dBm
LTE Band 25	AV	22±1dBm
LTE Band 26	AV	22±1dBm
LTE Band 38	AV	22±1dBm
LTE Band 41	AV	22±1dBm
LTE Band 66	AV	22±1dBm
BLE	AV	2±1dBm



Protocol	Fre. (MHz)	Separation distance (cm)	Max AVG Power (dBm)	ANT Gain (dBi)	Max ERP (mW)	Power Density (mW/cm ²)	Limit (mW/c m ²)	Ratio	Result
LTE Band 2	1850	20	23	1.3	269.153	0.054	1	0.054	Pass
LTE Band 4	1710	20	23	3.2	416.869	0.083	1	0.083	Pass
LTE Band 5	824	20	23	2.6	363.078	0.072	0.549	0.132	Pass
LTE Band 7	2500	20	23	4	501.187	0.100	1	0.0997	Pass
LTE Band 12	699	20	23	2.6	363.078	0.072	0.466	0.1550	Pass
LTE Band 13	777	20	23	2.6	363.078	0.072	0.518	0.1394	Pass
LTE Band 25	1850	20	23	1.3	269.153	0.054	1	0.0535	Pass
LTE Band 26	814	20	23	2.6	363.078	0.072	0.5427	0.1331	Pass
LTE Band 38	2570	20	23	3	251.768	0.050	1	0.0501	Pass
LTE Band 41	2496	20	23	4	316.957	0.063	1	0.0631	Pass
LTE Band 66	1710	20	23	3.2	416.869	0.083	1	0.0829	Pass
BLE	2402	20	3	1.2	2.63	0.0005	1	0.0005	Pass

Multiple transmission:

$$\text{LTE} + \text{BLE} = 0.1550 + 0.0005 = 0.1555 < 1$$

Note: 1. The Maximum power is less than the limit, complies with the exemption requirements.

$$2. \text{ERP} = \text{EIRP} - 2.15$$

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