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

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Page 2 of 9 Report No.: STS2308119H01

TEST REPORT

Applicant's Name:		
Address:	Room 20 District,SI	01, Buliding 1,No 215, Gaoguang RD, Qingpu Shanghai, China
Manufacturer's Name:		
Address:	Room 20 District,SI	01, Buliding 1,No 215, Gaoguang RD, Qingpu Shanghai, China
Product Description		
Product Name:	GNSS Re	eceiver
Brand Name:	N/A	
Model Name:	R61	
Series Model(s):	N/A	
Test Standards:	FCC 47C 447498 D	CFR §2.1091 D04 Interim General RF Exposure Guidance v01
		in full, without the written approval of STS, this documen I 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

Technical Manager:

(Aaron Bu)

Seam She

(Sean she)

(Sean she)

(Chris Chen)



Page 3 of 9

Report No.: STS2308119H01

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



Page 4 of 9

Revision History

Report No.: STS2308119H01

Rev.	Issue Date	Report No.	Effect Page	Contents
00	21 Aug. 2023	STS2308119H01	ALL	Initial Issue
9		*		

Report No.: STS2308119H01



1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name		1000				
Model Number R61	Product Name	GNSS Receiver	/. 7/			
N/A	Brand	N/A				
Model Difference	Model Number	R61				
The EUT is GNSS Receiver	Series Model(s)	N/A				
LTE Band 2: 1850 MHz -1910 MHz	Model Difference	N/A				
Adapter Input: AC 100-240V,50/60Hz Output:DC15V 3A Hardware Version R61NETV5 20221121	Product Description	Operation Frequency: Modulation Type: Antenna gain:	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 LTE: QPSK/16QAM BLE: GMSK LTE Band 2:1.3dBi LTE Band 4: 3.2dBi LTE Band 7:4 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: GSM ANT			
Hardware Version R61NETV5 20221121	Rating	Input:DC15V 3A				
	Adapter					
Software Version LIANSHI R61NETV2.4.4EF	Hardware Version	R61NETV5 20221121				
	Software Version	LIANSHI R61NET	V2.4.4EF			



Page 6 of 9 Report No.: STS2308119H01

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

Page 7 of 9 Report No.: STS2308119H01

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	Electric Field	Magnetic Field	Power Density
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)
Limits for Occupational	/ controlled Exposures		
300 - 1500			F/300
1500 – 100000			5.0
Limits for General popu	lation / Uncontrolled Exp	osure	
300 - 1500			F/1500
1500 – 100000			1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 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.

Page 8 of 9 Report No.: STS2308119H01

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



Page 9 of 9 Report No.: STS2308119H01

Protocol	Fre. (MHz)	Separation distance (cm)	Max AVG Power (dBm)	ANT Gain (dBi)	Max ERP (mW)	Power Density (mW/cm²)	Limit (mW/c m²)	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:

LTE+BLE=0.1550+0.0005=0.1555<1

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

2. ERP = EIRP - 2.15

****END OF THE REPORT***