

# Radio Test Report

Report No.: STS2401161H01

Issued for

HAMATON AUTOMOTIVE TECHNOLOGY CO., LTD

12 East Zhenxing Road, Linping, Yuhang, Hangzhou, 311100,  
China

Product Name: NLP Sensor

Brand Name: Hamaton

Model Name: NLP2024001

Series Model(s): NLP2024002

FCC ID: 2AFH7NLP2024001

Test Standards: FCC 47CFR §2.1091

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the ShenZhen STS Test Services Co., Ltd.





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	28 Mar. 2024	STS2401161H01	ALL	Initial Issue



## 1. GENERAL INFORMATION

### 1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	NLP Sensor	
Brand Name	Hamaton	
Model Name	NLP2024001	
Series Model(s)	NLP2024002	
Model Difference	Both of models have the same circuit schematic, construction, PCB Lavout and critical components. The difference of Install different car models.	
Product Description	The EUT is NLP Sensor	
	Operation Frequency:	433.92MHz
	Modulation Type:	FSK
	Antenna gain:	Metal
	Antenna Designation:	1.2 dBi
Battery	Rated Voltage: 3.0V Charge Limit Voltage:N/A Capacity: 350mA	
Rating	Input: DC 3V	
Hardware Version	V1.0	
Software Version	V08	

### 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 <sup>2</sup> )
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:  $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

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.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
SRD	PK	-36±1dBm

Protocol	Fre. (GHz)	Separation distance (cm)	Max Turn up power (dBm)	Max ERP (mW)	Pd (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
SRD	0.43392	20	-35	0.0000316	8.28*10 <sup>-9</sup>	0.28928	Pass

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

2. Calculated formula:  $EIRP(dBm)=58.62(dBuV/m)-95.2$

3.  $ERP = EIRP - 2.15$

4.  $Pd=(Pout * G) / (4*pi*r^2)=(0.0000316*1.318)/(4*3.1416*20*20)=8.28*10^{-9}$

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