Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SAR TEST REPORT

PRODUCT	Multimedia Control System
BRAND	HAVAL
MODEL	IN9.0
APPLICANT	NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.
FCC ID	2A7V5-IN90-1
ISSUE DATE	September 7, 2022
STANDARD(S)	FCC 47 CFR Part 2 §2.1091

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CONTENTS

1 Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard(s)	Title	Version
1	FCC 47 CFR Part 2 §2.1091	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS. Section 2.1091 Radiofrequency radiation exposure evaluation: mobile devices	N/A

1.2 Reference Documents

No.	Reference Document(s)	Title	Version
1	KDB447498	General RF Exposure Guidance	D01 v06

1.3 Data Provided by Applicant

No.	Item(s)	Data
1	Maximum output power	Antenna 1: Wi-Fi 5G U-NII-1:8.0 dBm Wi-Fi 5G U-NII-3:14.0 dBm BT:13.0 dBm BLE:4.0 dBm Antenna 2: Wi-Fi 2.4G:19.0 dBm Wi-Fi 5G U-NII-1:8.0 dBm Wi-Fi 5G U-NII-3:16.0 dBm
2	Antenna gain	Antenna 1: 2400MHz-2500MHz Peak Gain:2.34 dBi 5150MHz-5850MHz Peak Gain:3.90 dBi Antenna 2: 2400MHz-2500MHz Peak Gain:2.34 dBi 5150MHz-5850MHz Peak Gain:3.90 dBi
NOTE: The data of Maximum output power and Maximum antenna gain are provided by the customer may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.		

2 General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4，No. 766，Jingang Road，Pudong，Shanghai，China
Telephone	021-68866880
FCC Registration No.	958356
FCC Designation No.	CN1177

2.2 Laboratory Environmental Requirements

Temperature	18℃~25℃
Relative Humidity	25%RH~75%RH

2.3 Project Information

Project Manager	Xu Yuting
Test Date	N/A

3 General Information of The Customer

3.1 Applicant

Company	NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.
Address	No. 668, Caihong Road, Zhangjiagang Economic and Technological Development Zone, Suzhou , Jiangsu, P.R. China
Telephone	0512-80616208

3.2 Manufacturer

Company	NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.
Address	No. 668, Caihong Road, Zhangjiagang Economic and Technological Development Zone, Suzhou , Jiangsu, P.R. China

4 General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	Multimedia Control System
Model	IN9.0
Date of Receipt	N/A
EUT ID*	N/A
SN/IMEI	N/A
Supported Radio Technology and Bands	WLAN 802.11a/b/g/n/ac BT5.1,BLE
Tx Frequency	2412-2472 MHz (Wi-Fi 2.4G) 5180-5240 MHz (U-NII-1) 5745-5825 MHz (U-NII-3) 2402-2480 MHz (BT/BLE)
Hardware Version	AA
Software Version	AA
FCC ID	2A7V5-IN90-1
NOTE: EUT ID is the internal identification code of the laboratory.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
N/A	N/A	N/A	N/A
NOTE: AE ID is the internal identification code of the laboratory.			

5 General Description

5.1 Evaluation Distance

Evaluation distance 20cm as a distance between the equipment and the operator or user when it is used normally. The distance used for the assessment had be specified by the manufacturer and be onsistent with the intended usage of the equipment.

5.2 Evaluation Method

For conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the KDB447498 D01 and FCC 47 CFR Part 2 § 2.1091, the DUT is evaluated as a mobile device.

$$S = \frac{P \times G}{4\pi d^2}$$

Where

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

6 Assessment Results

6.1 Standalone Evaluation

6.1.1 Limit/Criterion

Table 6.1.1-1 Limits for Occupational / Controlled Exposure

Limits for Occupational / Controlled Exposure				
Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minitues)
0.3 – 3.0	614	1.63	(100)*	6
3.0 – 30	1824/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1	6
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6
Limits for General Population / Uncontrolled Exposure				
Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minitues)
0.3 – 1.34	614	1.63	(100)*	30
1.34 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	--	--	F/1500	30
1500 - 100000	--	--	1	30
NOTE: f = frequency in MHz; * Plane-wave equivalent power density. For the DUT, the limits for General Population / Uncontrolled Exposure are applicable.				

6.1.2 Standalone Evaluation

Table 6.1.2-1: Standalone Evaluation

Antenna	Band	Frequency (MHz)	Tune Up (dBm)	Highest Output Power (dBm)	Highest Output Power (mW)	Antenna Gain(dBi)	Numeric antenna gain	Power density at 20cm(mW/cm^2)	Limit (mW/cm^2)	Power density /Limit
ANT1	Wi-Fi 5G U-NII-1	5180	8.00	8.00	6.31	3.900	2.455	0.003	1.000	0.003
ANT1	Wi-Fi 5G U-NII-3	5745	14.00	14.00	25.12	3.900	2.455	0.012	1.000	0.012
ANT1	BT	2402	13.00	13.00	19.95	2.340	1.714	0.007	1.000	0.007
ANT1	BLE	2402	4.00	4.00	2.51	2.340	1.714	0.001	1.000	0.001
ANT2	Wi-Fi 2.4G	2412	19.00	19.00	79.43	2.340	1.714	0.027	1.000	0.027
ANT2	Wi-Fi 5G U-NII-1	5180	8.00	8.00	6.31	3.900	2.455	0.003	1.000	0.003
ANT2	Wi-Fi 5G U-NII-3	5745	16.00	16.00	39.81	3.900	2.455	0.019	1.000	0.019

6.2 Simultaneous transmission Evaluation

Table 6.2-1 Simultaneous transmission Evaluation

Antenna	1	Antenna	2	1+2
Antenna 1	Power density /Limit	Antenna 2	Power density /Limit	∑(Power density /Limit)
Wi-Fi 5G	0.012	Wi-Fi 2.4G	0.027	0.039
		Wi-Fi 5G	0.019	0.031
BT	0.007	Wi-Fi 2.4G	0.027	0.034
		Wi-Fi 5G	0.019	0.026
BLE	0.001	Wi-Fi 2.4G	0.027	0.028
		Wi-Fi 5G	0.019	0.020

Note1: ∑(Power density /Limit) : This is a summation of [(Power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for Wi-Fi+BT and Wi-Fi MIMO.
Note2: Considering the BT collocation with the Wi-Fi transmitter and Wi-Fi MIMO of the Highest output power performance listed in the table above, the aggregated (Power density /Limit) is smaller than1, and MPE collocated transmitters is compliant.

Annex A: Revised History

Version	Revised Content
V00	Initial

END OF REPORT