Test Report

Verified code: 266424

Report No.: E202407050641-11

Customer:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China
Sample Name:	Multimedia Player Assembly
Sample Model:	TR4304/40
Receive Sample Date:	Jul.09,2024
Test Date:	Aug.15,2024 ~ Sep.21,2024
Reference Document:	47 CFR, FCC Part 2.1091 Radio frequency radiation exposure evaluation: mobile devices
Test Result:	Pass

Prepared by: Huang Lifang

Reviewed by: Wu Haoting

Approved by: Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-10-23

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202407050641-11	Original Issue	2024-10-11

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1. GENERAL DESCRIPTION OF EUT

1.1 APPLICANT

Name:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

1.2 MANUFACTURER

Name:	Huizhou Desay SV Automotive Co., Ltd.
Address:	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

1.3 FACTORY

Name :	Huizhou Desay SV Automotive Co., Ltd.
Address :	No 103, Hechang 5th Road West, Zhongkai National Hi-tech Industrial Development Zone, Huizhou City, 516006 Guangdong, P.R. China

1.4 BASIC DESCRIPTIONOF EQUIPMENTUNDER TEST

Equipment:	Multimedia Player Assembly
Model No.:	TR4304/40
Adding Model:	TR4324/40
Model difference description:	The models are the same as function：RAM, RF module, storage capacity, Bluetooth chip, GNSS chip, FM and AM chip, Ethernet function, only the mounting bracket are different.
Trade Mark:	 Great Wall
FCC ID:	2AEQTTR432440
Power supply:	DC 12V, 15A.
Frequency Band:	2402MHz - 2480MHz for Bluetooth GFSK, Pi/4DQPSK, 8DPSK 5180MHz-5240MHz & 5745MHz~5825MHz for IEEE 802.11a/n HT20/ac VHT20; 5190MHz-5230MHz & 5755MHz~5795MHz for IEEE 802.11n HT40/ac VHT40; 5210MHz & 5775MHz for IEEE 802.11ac VHT80
Transmit Power:	Bluetooth GFSK:7.83 dBm Bluetooth π/4-DQPSK:9.58dBm Bluetooth 8DPSK:10.12dBm U-NII-1: 10.58dBm for IEEE 802.11a 10.49dBm for IEEE 802.11n HT20 10.44dBm for IEEE 802.11acVHT20

	1.85dBm for IEEE 802.11n HT40 1.62dBm for IEEE 802.11acVHT40 1.30dBm for IEEE 802.11ac VHT80 U-NII-3: 11.41dBm for IEEE 802.11a 11.51dBm for IEEE 802.11n HT20 11.48dBm for IEEE 802.11acVHT20 11.74dBm for IEEE 802.11n HT40 11.99dBm for IEEE 802.11acVHT40 9.61dBm for IEEE 802.11ac VHT80
Modulation type:	GFSK&Pi/4DQPSK&8DPSK for Bluetooth, OFDM for IEEE 802.11a/n/ac mode
Antenna Specification:	Bluetooth: Antenna 1: 1.3dBi gain (Max) 5G WIFI: 5150MHz – 5250MHz Antenna 2: 1.6dBi gain (Max) 5G WIFI: 5725MHz – 5850MHz Antenna 2: 1.6dBi gain (Max)
Temperature Range:	-40℃~+85℃
Hardware Version:	HW001
Software Version:	SW001
Sample No:	E202407050641-0029, E202407050641-0030
Note:	1.The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions. 2. The model TR4304/40 was recorded in this report.

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2. LABORATORY

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

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2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA	A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

General

According to the KDB 447498 D04 Interim General RF Exposure Guidance v01,General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table 4.1 to support an exemption from further evaluation from 300 kHz through 100 GHz.

TABLE 4.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			**Minimum Distance**			**Threshold ERP**
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 R^2f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

For mobile devices that are not exempt per Table 4.1 at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (4.1).

Formula (4.1):

$$P_{th}\ (\text{mW}) = ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

4. CALCULATION METHOD

Predication of MPE limit at a given distance

EIRP(dBm)=Maximum Tune-up Output power (dBm)+Maximum antenna gain(dBi)

ERP(dBm)=EIRP(dBm)-2.15

R=minimum distance to the center of radiation of the antenna

From the EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the maximum gain of the used as following information, the RF power ERP can be obtained.

Table 1 Antenna Specification

Mode	Antenna type	Internal Identification	Maximum antenna gain
Bluetooth	PCB antenna	Antenna 1	1.3dBi
5GHz WiFi U-NII-1	PCB antenna	Antenna 2	1.6dBi
5GHz WiFi U-NII-3	PCB antenna	Antenna 2	1.6dBi

Table 2 Transmit Power

Mode		Maximum Output Power (dBm)	Maximum Tune-up Output power (dBm)
Bluetooth DH5		7.83	8.00±1.00
Bluetooth 2DH5		9.58	10.00±1.00
Bluetooth 3DH5		10.12	10.50±1.00
5GHz WiFi U-NII-1	802.11a	10.58	11.00±1.00
	802.11n HT20	10.49	10.50±1.00
	802.11ac VHT20	10.44	10.50±1.00
	802.11n HT40	1.85	2.00±1.00
	802.11ac VHT40	1.62	2.00±1.00
	802.11ac VHT80	1.30	1.50±1.00
5GHz WiFi U-NII-3	802.11a	11.41	11.50±1.00
	802.11n HT20	11.51	12.00±1.00
	802.11ac VHT20	11.48	11.50±1.00
	802.11n HT40	11.74	12.00±1.00
	802.11ac VHT40	11.99	12.00±1.00
	802.11ac VHT80	9.61	10.00±1.00

5. ESTIMATION RESULT

5.1 MEASUREMENT RESULTS

STANDALONE MPE

Mode	Frequency (MHz)	Maximum Tune-up Output power (dBm)	Antenna Gain (dBi)	Maximum Tune-up EIRP (dBm)	ERP (dBm)	Maximum Tune-up ERP (W)	Threshold ERP(W)
BT	2402- 2480	10.50	1.3	11.80	9.65	0.009	0.768
5GHz WiFi U-NII-1	5150-5250	11.00	1.6	12.60	10.45	0.011	0.768
5GHz WiFi U-NII-3	5725-5850	12.00	1.6	13.60	11.45	0.014	0.768

Remark:

1. RF Exposure use distance is 20cm from manufacturer declaration of user manual.
2. Threshold ERP(W)= 19.2R ²(W)=19.2*0.2*0.2(W)=0.768(W).
3. ERP(dBm)=EIRP(dBm)-2.15

For Simultaneous transmission:

∑ MPE ratios= MPE ratio(BT)+ MPE ratio(5G wifi-U-NII-1);

∑ MPE ratios= MPE ratio(BT)+ MPE ratio(5G wifi-U-NII-3);

Maximum Simultaneous transmission MPE Ratio for BT and RLAN(5G wifi)

Maximum MPE ratio (BT)	Maximum MPE ratio (5G wifi-U-NII-3)	∑ MPE ratios	Limit	Results
0.012	0.018	0.030	1.000	Pass

Note:

1. The bluetooth and wifi support simultaneous.
2. ERP_j: the available maximum time-averaged power or the ERP, whichever is greater, of fixed, mobile, or portable RF source j.
3. $ERP_{th,j}$: exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least $\lambda/2\pi$, according to the applicable §1.1307(b)(3)(i)(C) Table 1 formula at the location in question.
4. Maximum MPE Ratio (BT) = Maximum Tune-up ERP(BT) / Threshold ERP =0.009W/0.768W= 0.012;
5. Maximum MPE Ratio (5G wifi-U-NII-3) =Maximum Tune-up ERP (5G wifi-U-NII-3) / Threshold ERP =0.014W/0.768W=0.018 ;
6. ∑ MPE ratios= Maximum MPE Ratio (BT)+ Maximum MPE Ratio (5G wifi-U-NII-3) =0.012+0.018=0.030<1.

The result is pass.

6. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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