Testing Laboratory
3023

Test report No.: 23B0419R-RFUSV17S-A

RF Exposure Report

Product Name	Truck Infotainment-System
Trademark	APTIV
Model and /or type reference	New HMI 2.0
FCC ID	LTQHMI20
Applicant´s name / address	Aptiv Services Deutschland GmbH Am Technologiepark 1 D–42119 Wuppertal Germany
Manufacturer´s name	Aptiv Services Deutschland GmbH
Test method requested, standard	KDB 447498 D01 v06 ☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Verdict Summary	IN COMPLIANCE
Documented By (Supervisor / Jinn Chen)	Jinn Chen
Tested By (Senior Engineer / Alan Chen)	Alan Chen
Approved By (Manager / Tim Sung)	Tim Sung
Date of Receipt	2023/11/14
Date of Issue	2024/01/25
Report Version	V1.0

Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Report No.	Version	Description	Issued Date
23B0419R-RFUSV17S-A	V1.0	Initial issue of report.	2024/01/25

1. General Information

1.1. EUT Description

Product Name	Truck Infotainment-System
Trademark	APTIV
Model and /or type reference	New HMI 2.0
Blockchain verified QR code	

Note: For more detailed information please refer to report No.: 23B0419R-RFUSV01S-A, 23B0419R-RFUSV01S-B, 23B0419R-RFUSV01S-C and 23B0419R-RFUSV03S-A.

2. Test Facility

USA	FCC Registration Number: TW0033

Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
	Linkou Laboratory
Address	No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

3. RF Exposure Evaluation

3.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

3.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of 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)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

3.3. Test Result of RF Exposure Evaluation

Product	Truck Infotainment-System
Test Item	RF Exposure Evaluation

Band	conducted output power (dBm)	Antenna Gain (dBi)	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)
Bluetooth	7.04	2.00	9.040	8.017	0.002	1
Bluetooth LE	6.15	2.00	8.150	6.531	0.001	1
2.4 GHz WLAN	16.94	-1.00	15.940	39.264	0.008	1
WiFi 5GHz U-NII 1	16.96	5.00	21.960	157.036	0.031	1
WiFi 5GHz U-NII 3	16.93	5.00	21.930	155.955	0.031	1

Note: The conducted output power is refer to report No.: 23B0419R-RFUSV01S-A, 23B0419R-RFUSV01S-B, 23B0419R-RFUSV01S-C and 23B0419R-RFUSV03S-A from the DEKRA.

Results	PASS