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Test report No:
21B0294R-RF-US-P20V01

FCC Exposure TEST REPORT

Product Name	SmartDiag2
Trademark	OCTO
FCC ID	2AHR8-SDIAG2
Model and /or type reference	Case type A or case type B; with or without logo on the case.
Applicant´s name / address	OCTO Telematics S.p.A. Via V. Lamaro, 51, Roma
Test method requested, standard	KDB 447498D01V06 FCC Part1.1310
Verdict Summary	IN COMPLIANCE
Documented By (name / position & signature)	Tim Cao/Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Supervisor 
Date of issue	2022-05-25
Report template No	Template_FCC-MPE-RF-V1.0

INDEX

page

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.

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GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Nov. 09, 2021
Date (start test)	Nov. 13, 2021
Date (finish test)	Jan. 10, 2022

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT : Equipment Under Test
QP : Quasi-Peak
CAV : CISPR Average
AV : Average
CDN : Coupling Decoupling Network
SAC : Semi-Anechoic Chamber
OATS : Open Area Test Site
BW : Bandwidth
AM : Amplitude Modulation
PM : Pulse Modulation
HCP : Horizontal Coupling Plane
VCP : Vertical Coupling Plane
U_N : Nominal voltage
*T*x : Transmitter
*R*x : Receiver
N/A : Not Applicable
N/M : Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
21B0294R-RF-US-P20V01	V1.0	Initial issue of report.	2022-05-25

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with KDB 447498 and FCC Part 1.1310
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results relate only to the samples tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
   - Chapter 1.1 General Description of the Item(s);
   - Chapter 1.2 Antenna Informaion;
   - Chapter 1.3 Model List;

1.1 General Description of the Item(s)

Product Name.....:	SmartDiag2
Model No. .....:	Case type A or case type B; with or without logo on the case.
FCC ID.....:	2AHR8-SDIAG2
Manufacturer.....:	OCTO Telematics S.p.A.
Manufacturer address.....:	Via V. Lamaro, 51, Roma
Model differences .....:	The type A is equipped with a Type A OBD plug; the type B is equipped with a Type B OBD plug. Both models may optionally have the manufacturer logo engraved on the case

Wireless specification .....:	Bluetooth					
Operating frequency range(s).....:	2400~2483.5MHz					
Type of Modulation .....:	GFSK					
PHYs.....:	☒	LE 1M	☐	LE 2M	☐	LE Coded S=2/8
Data Rate.....:	☒	1Mbit/s	☐	2Mbit/s	☐	500/125 Kbit/s
Number of channel .....:	40					

Rated power supply.....:	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☐	AC: 100 – 240 V, 50/60 Hz
	☐	48 Volt via POE
	☒	12 V or 24 V nominal
Mounting position.....:	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Head-mounted equipment
	☒	Other: Equipment for vehicular use

1.2 Antenna Information

Antenna model / type number.....:	N/A			
Antenna serial number.....:	N/A			
Antenna Delivery .....:	☒	1TX + 1RX		
	☐	2TX + 2RX		
	☐	Others:……		
Antenna technology.....:	☒	SISO		
	☐	MIMO	☐	CDD
			☐	Beam-forming
Antenna Type .....:	☐	External	☐	Dipole
			☐	Sectorized
	☒	Internal	☐	FPC
			☒	Chip
			☐	Metal Monopole Antenna
			☐	Ceramic chip
			☐	Others……..
Antenna Gain.....:	1.1dBi			

1.3 Model List

Supplier	Product code	ESIM	OBD plug type	Voltage	Plastic case
LIKEGO	OBD13LK	VDF CAT-M1	A	12V	Octo Logo
LIKEGO	OBD13LK-02	VDF CAT-M1	B	24V	NO LOGO
LIKEGO	OBD13LK-03	VDF CAT-M1	A	12V	NO LOGO
LIKEGO	OBD13LK-04	VDF CAT-M1	B	24V	Octo Logo
B810	BSDIASV00	VDF	A	12V	Octo Logo
B810	BSDIASVM00	VDF CAT-M1	A	12V	Octo Logo
B810	BSDIASA00	AT&T	A	12V	Octo Logo
B810	BSDIASVNL00	VDF	A	12V	NO LOGO
B810	BSDIASVMNL00	VDF CAT-M1	A	12V	NO LOGO
B810	BSDIASANL00	AT&T	A	12V	NO LOGO
B810	BSDIASV2400	VDF	B	24V	Octo Logo
B810	BSDIASVM2400	VDF CAT-M1	B	24V	Octo Logo
B810	BSDIASA2400	AT&T	B	24V	Octo Logo
B810	BSDIASV24NL00	VDF	B	24V	NO LOGO
B810	BSDIASVM24NL00	VDF CAT-M1	B	24V	NO LOGO
B810	BSDIASA24NL00	AT&T	B	24V	NO LOGO

2. RF Exposure Evaluation

2.1. 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/cm2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula
Friis transmission formula: Pd = (Pout*G)/(4*pi*r2)

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 center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18℃and 78% RH.

2.3. Test Result of RF Exposure Evaluation

Product	:	SmartDiag2
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Power Density：

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (W/m^2)	Power Density Limit (W/m^2)
Bluetooth	2400 ~ 2483.5	-34.56	6.96194E-07	10

Note：The maximum power density is 6.96194E-07mW/cm2 for EUT without any other radio equipment.

The End