

TEST REPORT

Ref. n.	MPETR_185069-0	Issue Date:	21/06/2024	Pages:	9
Test object	Type test according to Standard FCC Cfr 47 part 2 - §2.1093				
Applicant	M.A.E. ELETTRONICA S.r.l. Via Presolana 33/35 – 24030 Medolago – Bergamo – Italy				
Trade mark					
Manufacturer	M.A.E. ELETTRONICA S.r.l.				
Product	Dashboard with integrated vehicle immobilizer				
Tested model	RTADM003				
FCC ID	2AVGH-RTADM003				
Date of test samples receipt	23/05/2024				
No. of tested samples	1 – Sampled by the manufacturer				
Test date	28/05/2024				
Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
FCC designation number	IT0012				
Test results	COMPLIANT				
Verifications carried out by	Daniele AOSANI Laboratory Engineer				
Approved by	Luana PARISI Reviewer				

The test results reported in this test report shall refer only to the samples tested.
The sample has been provided by the customer and the results apply to the sample as received.
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PRSLAB refuses any responsibility about information provided by the customer contained in this test report.

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0. RELEASE CONTROL RECORD

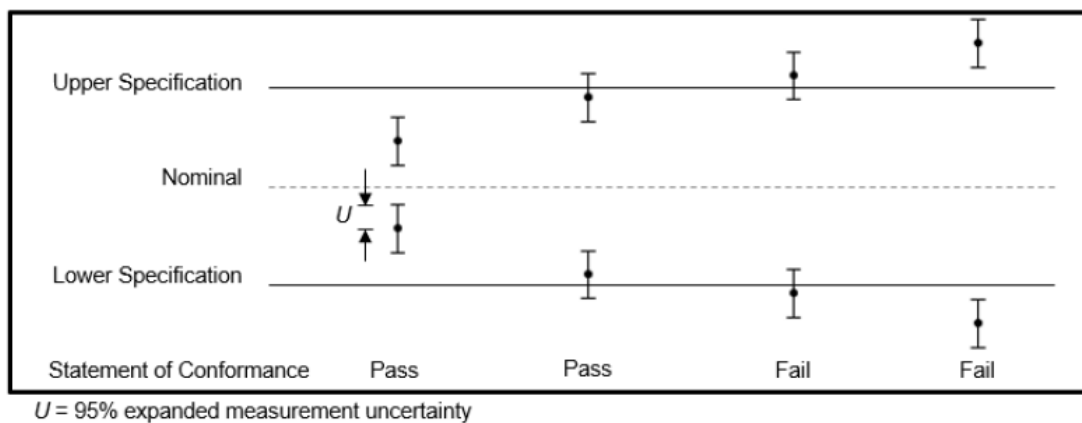
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_185069-0	Original release	21/06/2024

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRS LAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system ($w = 0$) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL=TL$.
- Fail: the measured value is above the acceptance limit, $AL=TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w=|TL-AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

- None

3. GENERAL REMARKS

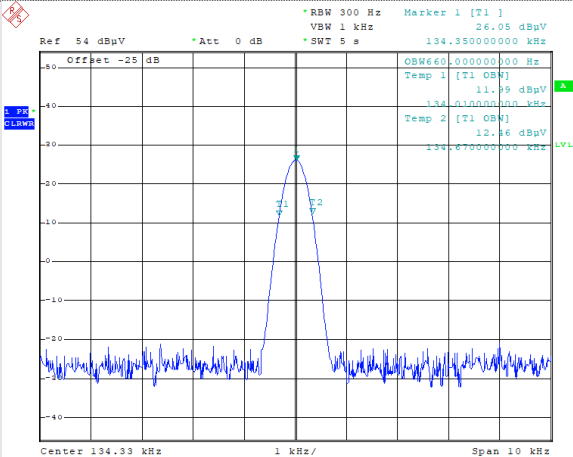
- None

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Dashboard with integrated vehicle immobilizer
MODEL NAME	RTADM003
FCC ID	2AVGH-RTADM003
SERIAL NO.	MT240090650
PRS LAB INTERNAL REFERENCE	BC 138/2024 4/5
TRADEMARK	
MANUFACTURER	M.A.E. ELETTRONICA S.r.l.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	Vehicle battery
SUPPLY VOLTAGE	12Vdc
MAX POWER or MAX ABSORBED CURRENT	NA
OPERATING TEMPERATURE	-40°C ÷ +85°C
SOFTWARE VERSION (Information provided by Customer)	11a.08.08
HARDWARE VERSION (Information provided by Customer)	02.02
DIMENSIONS	19.5 x 9.5 x 4 cm
EUT STANDING	☐ WALL; ☐ CEILING; ☐ TABLE; ☐ FLOOR; ☐ RACK MOUNTED; ☐ BODY WORN; ☐ HANDELD; ☐ PORTABLE; ☐ MOBILE; ☒ VEHICLE
HIGHEST INTERNAL FREQUENCY (Information provided by Customer)	☒ <108MHz; ☐ 108MHz<F<500MHz; ☐ 500MHz<F<1GHz; ☐ F>1GHz

4.2 RFID module technical data

CHIP MANUFACTURER	 TEXAS INSTRUMENTS
CHIP MODEL	TMS3705
ETS CATEGORY	Radio-Frequency Identification (RFID)
FREQUENCY RANGE	100-148 kHz f. band
CENTER FREQUENCY	134.3kHz
TRANSMITTER MAX POWER	24.30dBμV/m Peak@3m distance
TYPE OF MODULATION	ASK
ANTENNA TYPE (Information provided by Customer)	Inductive loop coil
ANTENNA GAIN (Information provided by Customer)	NA
ANTENNA MODEL (Information provided by Customer)	EL216
ANTENNA MANUFACTURER (Information provided by Customer)	 ZADI
MEASURED 99% BW	 99%BW = 660Hz

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☒	Enclosure	Plastic	Snap	---
☐	AC Power input	Port not present	---	---
☒	DC Power input	12Vdc	---	>3m
☒	Signal / Control port	CAN bus communication	---	---
☐	Telecomm.port	Port not present	---	---
☐	Antenna port	☒ Internal; ☐ External	---	---

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

4.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

4.5 Auxiliary equipment

- None

5. REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	DESCRIPTION
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1093	Radiofrequency radiation exposure evaluation: portable devices.
ANSI C63.4: 2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
FCC KDB 447498 D01	General RF Exposure Guidance v06

6. MEASUREMENTS AND CALCULATION RESULTS

6.1 Maximum Permissible Exposure - Limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

6.2 Maximum Permissible Exposure – MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

6.3 Calculation method, results and limits

Radio	Frequency	E-Field	E-Field	Distance	Power Density	Limit
	MHz	dBµV/m	µV/m	cm	mW/cm ²	mW/cm ²
RFID	0.134	24.3	16,40589773	20	0,000713935	1.0

END OF TEST REPORT