

TEST REPORT

Ref. n.	MPETR_187619-3	Issue Date:	07/10/2026	Pages:	9
Test object	Type test according to Standards FCC Cfr 47 part 2 - Subpart J - §2.1091				
Applicant	Vodafone Automotive S.p.A. Via Astico 41 - 21100 Varese - Italy Tel.: +39 0332 825111; +39 0332 825238				
Trade mark					
Manufacturer	Vodafone Automotive S.p.A.				
Product	HUB BLE				
Testing model	1090				
FCC identification number	NWD1090				
Date of test samples receipt	17/03/2026				
No. of tested samples	1 – Sampled by the Manufacturer				
Test date	23/03/2026				
Testing site	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy				
FCC designation number	IT0012				
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.

TABLE OF CONTENTS

0.	RELEASE CONTROL RECORD	3
1.	DECISION RULE	3
2.	INFORMATION PROVIDED BY CUSTOMER.....	3
3.	GENERAL REMARKS	3
4.	TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT).....	4
4.1	EUT Identification	4
4.2	Bluetooth Low Energy module technical data.....	5
4.2.1	Channel List Bluetooth Low Energy	5
4.3	Ports identification.....	6
4.4	Modifications incorporated in E.U.T.....	6
4.5	Auxiliary equipment.....	6
5.	REFERENCE STANDARDS	6
6.	MEASUREMENTS AND CALCULATION RESULTS	7
6.1	Maximum Permissible Exposure - Limit.....	7
6.2	Maximum Permissible Exposure – MPE Calculation Method	8
6.3	Calculation results and limits	8

0. RELEASE CONTROL RECORD

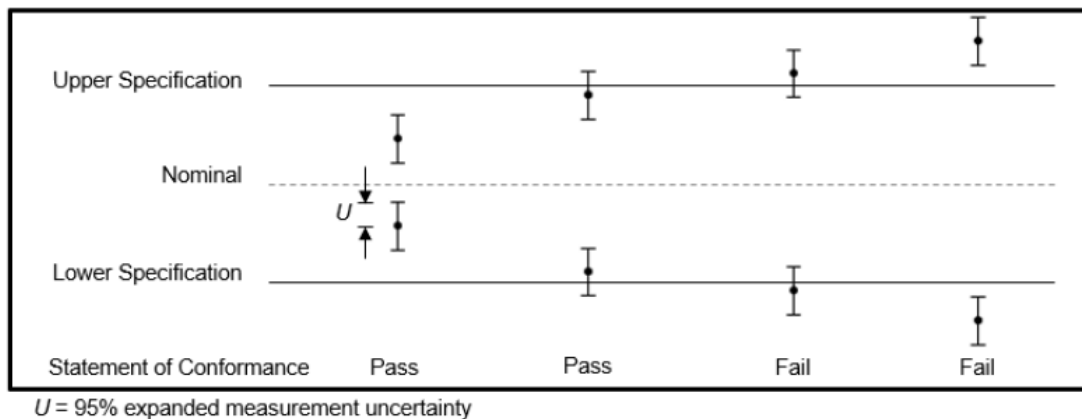
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_187619-0	Original release	30/04/2026
MPETR_187619-1	Updated the calculation on page 7 using 20cm for the fixed use	23/09/2026
MPETR_187619-2	Changed section 6 for Fixed use application	06/10/2026
MPETR_187619-3	Correct FCC part at page 1 and 6	07/10/2026

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

- The EUT was supplied by the manufacturer with a soldered SMA cable and with the programming port, these modifications are to allow the execution of tests and the setting of the BLE part, the final product does not have these components.

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	HUB BLE
MODEL NAME	1090
SERIAL NO.	032
PRSLAB INTERNAL REFERENCE	BC 70/2026 2/3
TRADEMARK	
MANUFACTURER	Vodafone Automotive S.p.A.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	Vehicle battery
POWER SUPPLY NOMINAL VOLTAGE	12Vdc
MAX ABSORBED CURRENT OR MAX POWER	2mA
OPERATING TEMPERATURE	-40°C ÷ +85°C
SOFTWARE VERSION (Information provided by Customer)	1.0.0-1.0.0
HARDWARE VERSION (Information provided by Customer)	4M1090AAA
DIMENSIONS	44.25 x 23.95 x 10.45 mm
EUT STANDING	☐ WALL; ☐ CEILING; ☐ TABLE; ☐ FLOOR; ☐ RACK MOUNTED; ☐ BODY WORN; ☐ HANDLED; ☐ PORTABLE; ☐ MOBILE; ☒ VEHICLE
HIGHEST INTERNAL FREQUENCY (Information provided by Customer)	☐ <108MHz; ☐ 108MHz<F<500MHz; ☐ 500MHz<F<1GHz; ☒ F>1GHz; F= 2480MHz

4.2 Bluetooth Low Energy module technical data

MODULE MANUFACTURER	 life.augmented
MODULE NAME	STM32WBA65
ETS CATEGORY	Bluetooth Low Energy
TYPE OF RADIO DEVICE	Transceiver
FREQUENCY BAND	2400 ÷ 2483.5MHz
NUMBER OF CHANNELS	40
CHANNEL BANDWIDTH	2MHz
CHANNEL SPACING	2MHz
DATA RATE	2Mbps
TYPE OF MODULATION	GFSK
RX SENSITIVITY	-96dBm
ANTENNA TYPE (Information provided by Customer)	Chip antenna
ANTENNA GAIN (Information provided by Customer)	2.5dBi
ANTENNA MODEL (Information provided by Customer)	ANT3216R24003KM1
ANTENNA MANUFACTURER (Information provided by Customer)	

4.2.1 Channel List Bluetooth Low Energy

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☒	Enclosure port	Plastic	Snap	---
☐	AC mains power port	Port not present	---	---
☒	DC power port	12Vdc	---	>3m
☐	Wired network port	Port not present	---	---
☒	Signal/control port	COM Cobra Bus	---	>3m
☒	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

- Auxiliary laboratory laptop used to set radio channels.

5. REFERENCE STANDARDS

REFERENCE STANDARD	DESCRIPTION
47 CFR FCC Part 2 Subpart J §2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
47 CFR FCC Part 1 Subpart I §1.1310	Radiofrequency radiation exposure limits.
KDB 447498 D01 v06	RF Exposure procedures and equipment authorization policies for mobile and portable devices
ANSI C63.10:2020; ANSI C63.10:2020/Cor.1:2023	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

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 results and limits

Radio	Frequency	EIRP	EIRP	Antenna Gain	Distance	Power Density	Limit
	MHz	dBm	mW	dBi	cm	mW/cm ²	mW/cm ²
Bluetooth Low Energy (DTS)	2402	-1.19	0.76	2.5	20	0.038	1.0
Verdict	PASS						

END OF TEST REPORT