

ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale: 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 22<u>020 Faloppio fraz.</u> Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309 Sede operativa : Laboratori Via Campagna, 92

TRANSMITTER at 868 MHz

EQUIPMENT UNDER TEST: APPARECCHIO IN PROVA:

TYRE TEMPERATURE AND PRESSURE WIRELESS CONTROL SENSOR RTS

REFERENCE STANDARDS: FCC 47CFR Part 15.231

NORME DI RIFERIMENTO:

CUSTOMER: RICHIEDENTE:

Dept. / Firm:

ZADI S.P.A.

Ente / Società':

Mr.:

SIG. CAVAZZA

Sig.:

Address:

VIA C.MARX, 138 - 41012 CARPI (MO)

Telefax:

Indirizzo:

+39 059 6323235 Tel.:

+39 059 6323240

E-mail:

daniele.cavazza@zadi.com

Telefono:

Fax:

Site of test execution:

Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy

Località esecuzione prove:

Date of test samples receipt: Data ricevimento campioni:

26/06/2007

Date of start test:

28/08/2007

Data inizio prove:

Date of end test:

15/09/2007

Data fine prove:

Witness to the test: Presenti alle prove:

Tested by: Testato da: Approved by: Approvato da:

Nobody / Nessuno

Massimiliano Tallariti

Massimo Maltempi

The test results recorded in this Test Report are exclusively referred to the tested samples.

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.

Reproduction of this EMC-Test Report in whole or in part is prohibited without the written authorization of the Laboratory Director La riproduzione di questo Rapporto in modo parziale o totale è PROIBITO senza l'autorizzazione scritta della Direzione del Laboratorio

Issue date: 15/09/2007

sheet 1 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

0 CONTENTS

0 CONTENTS	2
1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TES	ST (EUT) 3
1.1 E.U.T. identification	3
1.2 E.U.T. classification	3
1.3 Modifications incorporated in E.U.T	
1.4 Ports identification	4
1.5 Operating test modes and test Conditions	5
2 TEST CONDITIONS	6
2.1 Operating test modes and test conditions	6
2.2 Test overview	6
3 REFERENCE STANDARD FOR PERFORMED TESTS	6
4 SUMMARY OF TEST RESULTS	7
4.1 EMISSION TESTS	7
TEST RESULTS	8
5 EUT TECHNICAL DOCUMENTATION	22
5.1 Wiring diagrams	22
5.2 Technical manual	23
5.3 Photographic documentation	24

Edit. 2.0 sheet 2 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 E.U.T. identification

Brand name: ZADI SPA

Manufacturer: ZADI SPA

Model name or No.: TYRE TEMPERATURE AND PRESSURE

WIRELESS CONTROL SENSOR

mod. RTS

Part number / Serial No.: Not present

Country of manufacturer: ITALY

FCC ID: VFZZADIRTS01

1.2 E.U.T. classification

Modulation Transmitter 868 MHz in FSK

Supply voltage: Vdc internal lithium battery CR2025

Alternative battery CR123A not investigated

Single or Multiple Unit: Single

1.3 Modifications incorporated in E.U.T.

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

None

Edit. 2.0 sheet 3 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

1.4 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output ports, the maximum length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

Pc	ort	Description	Maximum length	Connection	Ancillaries / Modules / Support Equipment
1	Enclosure	Plastic case		By screws	
2	AC power input/output ports	Not present	*****	*****	None
3	DC power input/output ports	3 Vdc by internal power supply	*****	*****	None
4	Signals	Not present	*****	*****	None
	Ports				

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

Edit. 2.0 sheet 4 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

1.5 Operating test modes and test Conditions

EUT was tested under the Standard operating conditions and normal loads indicated in the reference standards applied and in directions for use supplied by the manufacturer. In particular, the equipment shall be tested under normal test conditions contained in the relevant product and basic standard or in the information accompanying the equipment.

<u>Table 1</u>: Each operating condition adopted for the execution of the test (setting of the controls and/or mode(s) of operation) has been identified by an indicator (#.):

Op	perating condition (#)	Description of the mode of operation
	(#1)	Transmission mode

Edit. 2.0 sheet 5 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

2 TEST CONDITIONS

2.1 Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

FCC Part 15, Subpart C, Section §15.203, §15.205, §15.207, §15.209, §15.231

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item "Operating condition of the equipment under test" of all technical sheets of the tests (see Section 4)

Operating condition	Description
#1	Continuous transmission

2.2 Test overview

Sample tested is the main model of a complete set of 868 MHz RF transmitters.

The appliance is classified as "Intentional radiator" in conformity to FCC Part 15 Sub. A §15.201, and it is subject to "Certification" procedure.

The application is mainly used for remote control check for whole pressure and temperature.

It is possible to declare that the appliance it is subject to additional requirements stated in §15.203, §15.205, §15.207, §15.209, §15.231

3 REFERENCE STANDARD FOR PERFORMED TESTS

Reference standard :	Title:	
FCC Part 15 part A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A	
	(General) of the Federal Communication Commission (FCC)	
FCC Part 15 part C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart C	
	(Intentional Radiators) of the Federal Communication Commission (FCC)	
ANSI C63.4	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	

Edit. 2.0 sheet 6 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

4 SUMMARY OF TEST RESULTS

4.1 EMISSION TESTS

Requirements	CFR Section	Test result
Antenna Requirements	15.203	Within the limit
Radiated Spurious Emission	15.209, 15.205(b)	Within the limit
Conducted Emission	15.207	Not applicable*
Periodic Operation Characteristics	15.231(a)	Within the limit
Field Strength Limits (Fundamental)	15.231(b)	Within the limit
20 dB Bandwidth	15.231(c)	Within the limit

^{*}Not required, the EUT is battery powered.

Edit. 2.0 sheet 7 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST RESULTS

ANTENNA REQUIREMENT	9
RADIATED FIELD 30 - 1000 MHZ	10
RADIATED FIELD 1 - 9 GHZ	13
CONDUCTED EMISSION TESTS	16
PERIODIC OPERATION CHARACTERISTICS	17
BANDWIDTH	18
TIMING	20

Edit. 2.0



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST 1.

ANTENNA REQUIREMENT

REFERENCE DOCUMENT

FCC CFR47,PART 15 subpart C

REGULATION:

15.203 an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

RESULT:

Antenna is a wire welded on the PCB.

The EUT is complied with this section.

Edit. 2.0 sheet 9 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST 2.

RADIATED FIELD 30 - 1000 MHZ

REFERENCE DOCUMENT

FCC47CFR Part 15

TEST SETUP:
 According to reference standard

TEST LOCATION:
 Semi-anechoic chamber

TEST EQUIPMENT USED FOR TEST:
 EMI receiver Rohde & Schwarz Mod. ESMI

Biconical Antenna Rohde & Schwarz Mod. HK116 Log-periodic Antenna Rohde & Schwarz Mod. HL223 Log-periodic Antenna Rohde & Schwarz Mod. HL025

• TESTED PORT: Enclosure
• FREQUENCY RANGE: 30 - 1000 MHz

• EMISSION LIMITS: Acc. to Section 15.209 + 15.231

of reference document

• UNCERTAINTY OF MEASURE: Combined uncertainty = \pm 1.75 dB

Total uncertainty = $(k=2) \pm 3.5 dB$

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal battery		3 Vdc (internal battery)

OPERATING CONDITION (Rif. Section. 2): #1

RESULT: WITHIN THE LIMIT

Edit. 2.0 sheet 10 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

80 kHz

120 kHz

W71.01

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. - C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139

22020 Faloppio fraz. Gaggino (CO) Sede operativa : Laboratori Via Campagna, 92 Tel. +39 03135000.11 Fax +39 031991309

SCAN TABLE: "Radiated Emission"

Unit: $dB\mu V/m$

> Detector: Mode:

Curve1: Max Peak ClearWrite ClearWrite Curve2: Avg

Subrange:

Start Frequency: 30.0 MHz Step Size: Stop Frequency: 1000.0 MHz IF Bandwidth:

Measure Time: 10 ms

CHASE_6111_PRC Receiver: **ESXI** Probe Transducer: Signal Path: Path 4 System Transducer: RFin2-CP1/X11

Add. Transducer:

Scan Mode: Lin Tracking Gen.: Off

2 DC Input:

Preamplifier: 10 dB Demodulation: FM Broad RF att.: Coupled Volume: 0.0% Ref. Level: -50 dBm Squelch: Min. RF att.: 0 dBm Option: None

Autorange: On

Curve 1: On Repetition: Single Stop Mark: Curve 2: On On

Stop Message: On

Text: Connect antenna

Edit. 2.0 sheet 11 of 25

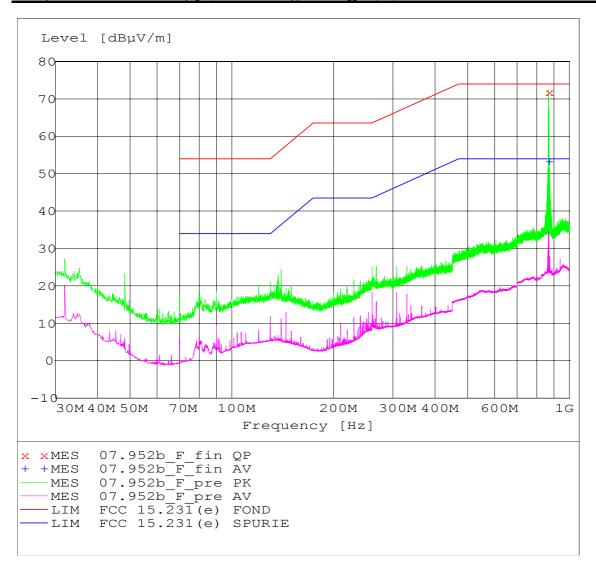


ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. - C.I. 02634780130 Sede legale: 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139

Sede operativa: Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309



Final measurement in QP detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
868.080000	71.80	12.20	74.00	2.20	175.0	16.00	VERTICAL

Final measurement in AV detector

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
868.480000	53.24	12.20	54.00	0.70	175.0	16.00	VERTICAL

NOTE:

The EUT is complied with 15.205 section.

Edit. 2.0 sheet 12 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST 3.

RADIATED FIELD 1-9 GHZ

REFERENCE DOCUMENT

FCC PART 15.231

• TEST LOCATION: Semi-anechoic chamber

• TEST EQUIPMENT USED FOR EMI RECEIVER Rohde & Schwarz Mod. ESU (20Hz-26.5GHz)

TEST: Log-periodica Broadband Antenna mod. HL025

Software Rohde & Schwarz EMC32

• TESTED PORT: Enclosure

EMISSION LIMITS:
 Acc. to Section 15.231 of reference document

• FREQUENCY BAND: Fundamental Frequency to 10th harmonics acc. to §15.231 (a)

• UNCERTAINTY OF MEASURE: Combined uncertainty = \pm 1.75 dB

Total uncertainty = $(k=2) \pm 3.5 dB$

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal battery		3 Vdc

OPERATING CONDITION (Rif. Section. 2): #1

RESULT: WITHIN THE LIMIT

Edit. 2.0 sheet 13 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

SCAN TABLE: "Radiated Emission"

Subrange 1

Frequency Range: 1GHz - 9GHz

Receiver: ESMI

@ GPIB0 (ADR 22

Signal Path: PRS Radiate

FW 1.0

Correction Table: PRS Radiate

Antenna: Log.Per. Broadband Antenna HL25a

Correction Table (vertical): HL025_PRS2006

Correction Table (horizontal): HL025_PRS2006

Correction Table: Path EmiFCC

Antenna Tower: Deisel Antenna Tower [Deisel Antenna Tower]

@ GPIB0 (ADR 7)

Turntable: Deisel Turntable [Deisel Turntable]

@ GPIB0 (ADR 7)

Resolution Bandwidth: 1 MHz

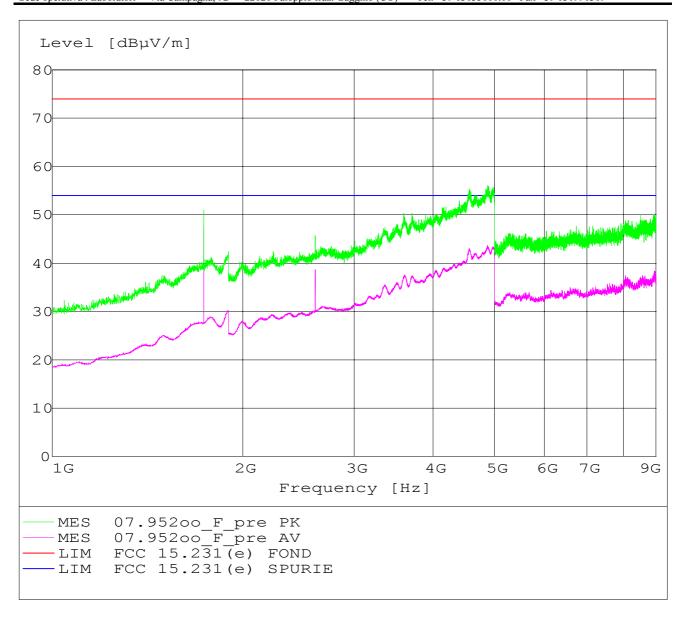
Edit. 2.0 sheet 14 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309



Edit. 2.0 sheet 15 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST 4.

CONDUCTED EMISSION TESTS

REFERENCE DOCUMENT

FCC CFR47,PART 15 subpart C ANSI C 63.4

REGULATION:

15.207(a) For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

15.207(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

RESULT:

Not applicable.

The EUT is battery powered only.

Edit. 2.0 sheet 16 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale: 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Tel. +39 03135000.11 Fax +39 031991309

22020 Faloppio fraz. Gaggino (CO) Sede operativa : Laboratori Via Campagna, 92

TEST 5.

PERIODIC OPERATION CHARACTERISTICS

REFERENCE DOCUMENT

FCC CFR47,PART 15 subpart C

REGULATION:

15.231(a) The provisions of this Section are restricted to periodic operation within the band 40.66 -40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. The prohibition against data transmission does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

(e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) and may be employed for any type of operation, including operation prohibited in paragraph (a), provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this Section, except the field strength table in paragraph (b) is replaced by the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)	
40.66 - 40.70	1,000	100	
70 - 130	500	50	
130 - 174	500 to 1,500 **	50 to 150 **	
174 - 260	1,500	150	
260 - 470	1,500 to 5,000 **	150 to 500 **	
Above 470	5,000	500	

^{**} linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 22.72727(F) - 2454.545; for the band 260-470 MHz, uV/m at 3 meters = 16.6667(F) - 2833.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

RESULT:

The EUT is complied with the section shown in paragraph (e). See graphics at the page 12 and 15 where limits for field strength are shown in upper table.

Edit. 2.0 sheet 17 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale: 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139

Sede operativa: Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

TEST 6.

BANDWIDTH

REFERENCE DOCUMENT

FCC CFR47,PART 15 subpart C

ANSI C63.4

• TEST LOCATION: Semi-anechoic chamber

• TEST EQUIPMENT USED FOR TEST: Spectrum Analyzer Rohde & Schwarz Mod. FSP (9kHz-40GHz)

Log-periodica Broadband Antenna mod. HL025

• TESTED PORT: Enclosure

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal battery		3.0 Vdc

OPERATING CONDITION (Rif. Section. 2): #1

Edit. 2.0 sheet 18 of 25

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

REGULATION:

15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

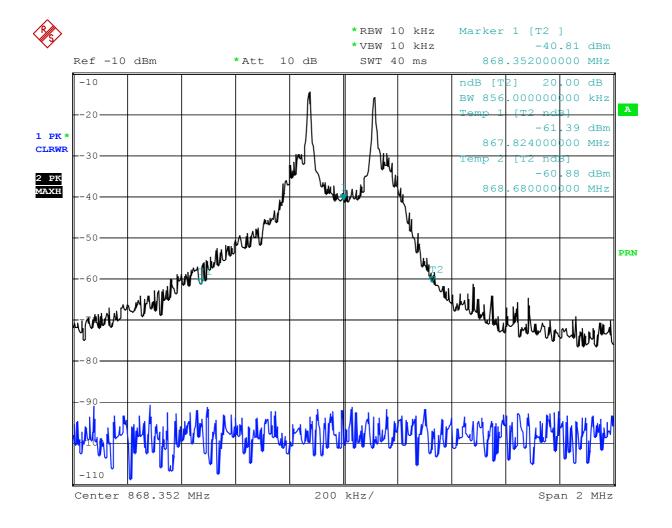
• LIMIT:

The 20 dB bandwidth limit = $0.0025 \times 868.35 \text{ MHz} = 2170.8 \text{ kHz}$

• RESULT:

The measured 20 dB bandwidth is: 867 kHz (See Graphic)

The EUT is complied with this section.



Date: 15.SEP.2007 08:34:05

Edit. 2.0 sheet 19 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. - C.I. 02634780130 Sede legale: 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139

22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309 Sede operativa : Laboratori Via Campagna, 92

TEST 7.

TIMING

REFERENCE **DOCUMENT**

FCC CFR47,PART 15 subpart C

ANSI C63.4

TEST LOCATION:

TEST EQUIPMENT USED FOR TEST:

Enclosure TESTED PORT:

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal battery		3.0 Vdc

OPERATING CONDITION (Rif. Section. 2): #1

REGULATION:

15.231(e) In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds

LIMIT:

Duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds

RESULT:

Total trasmission: <1s

Interval: 30s

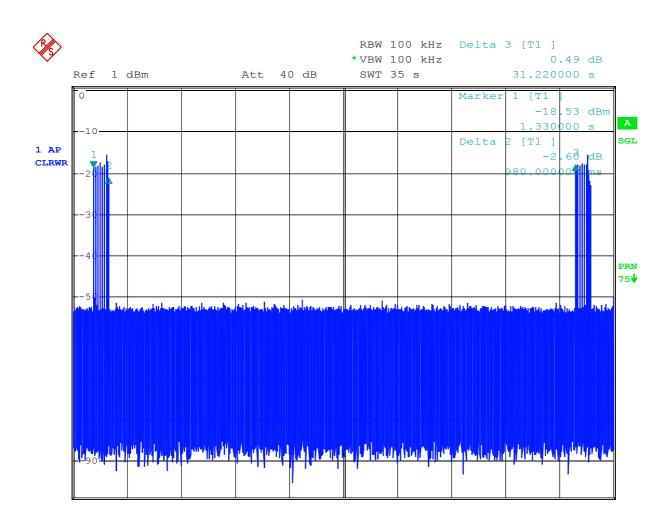
Edit. 2.0 sheet 20 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309



Date: 3.OCT.2007 09:22:14

Edit. 2.0 sheet 21 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

5 EUT TECHNICAL DOCUMENTATION

5.1 Wiring diagrams

	Document reference (n., edition, date,)
WIRING DIAGRAM	ZADI spa () Via C. Marx. 138 I-410/12 Carpi (MO) Italy
	TITOLO P992 - ZTS BIKE
	NOME FILE CENTRALE RICEVENTE - V02.scm
	AUTORE Romano Bernarducci
	VER 00 REV A DATA 17/01/2007 FOGLIO 1/2
	PROPRIETA ESCLUSIVA DI ZADI SPA. DIVIETO DI RIPRODUZIONE IN QUALSIASI FORMA SENZA AUTORIZZAZIONE SCRITTA.
	ZADI spa () Via C. Marx. 138 1-41012 Carpi (MO) Italy
	TITOLO SENSORE ZTS BIKE
	NOME FILE SENSORE - VØ2.scm
	AUTORE Romano Bernarducci
	VER ØØ REV A DATA Ø8/Ø9/2006 FOGL 10 1/1
	PROPRIETA ESCLUSIVA DI ZADI SPA. DIVIETO DI RIPRODUZIONE IN QUALSIASI FORMA SENZA AUTORIZZAZIONE SCRITTA.
GERBER	Gerber-Central Unit
	Gerber-Sensor
PART LIST	P992 – BOM Centrale
	P992 – BOM Sensore

Edit. 2.0 sheet 22 of 25



ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

5.2 Technical manual

				Rev 01
Family Products: RTS Real Time Sensor		Code of the involved	f products: Multiples	
Autor:	Approved: Data: Rev.:			
Daniele Cavazza		11/05/2007	00	
Т		Construction Time Sensor ZADI		

Edit. 2.0 sheet 23 of 25



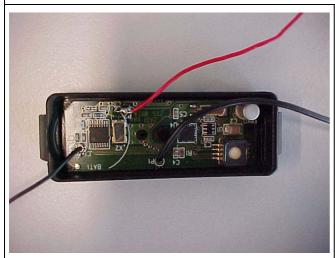
ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139 Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

5.3 Photographic documentation

PHOTO N°1 - E.U.T. IDENTIFICATION









Edit. 2.0 sheet 24 of 25



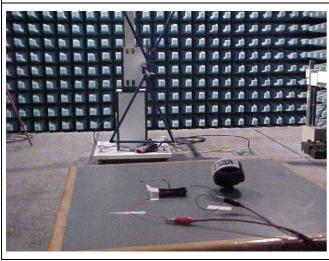
ELECTROMAGNETIC COMPATIBILITY TEST

FCC.TR. 07.952

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130 Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139

Sede operativa: Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

PHOTO N°2 – SET-UP EMISSION TESTS (30-1000MHz)



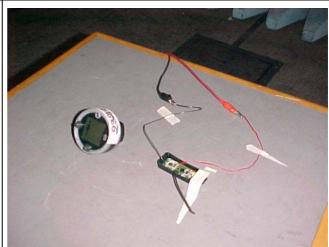


PHOTO N°3 – SET-UP EMISSION TESTS (1-9 GHz)



Edit. 2.0 sheet 25 of 25