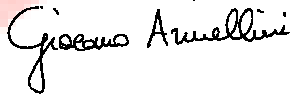
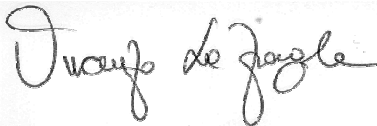




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RAPPORTO DI PROVA / TEST REPORT

Rif./Ref.No. FCCTR_121238-1	Data / Date: 28/11/2012	Pagine / Pages : 14
Scopo delle prove / Test object :	Prove di tipo in accordo a / Type test according to FCC Cfr 47 part 15 - §15.249	
Richiedente / Applicant :	ROTOR COMPONENTES TECNOLOGICOS SL C/Miño 16-18 – 28864 AJALVIR – MADRID - SPAIN	
Persona di riferimento / Applicant's referee :	Mr. Martinez	
Marchio commerciale / Trade mark :	ROTOR POWER	
Fabbricante / Manufacturer :	ROTOR COMPONENTES TECNOLOGICOS SL	
Prodotto / Product :	FORCE/TORQUE MEASUREMENT BATTERY DEVICE INCLUDING RADIO TX/RX 2,4GHZ	
Modello / Model :	RPM1	
Data ricevimento campioni / Date of test sample receipt:	19/10/2012	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	19/10/2012	
Sito di prova / Testing site :	Prima Ricerca & Sviluppo Via Campagna - 92 I - 22020 FALOPPIO CO	
Esito delle valutazioni / Assessment results :	CONFORME / COMPLIANT	
Verifiche effettuate da / Verifications carried out by :	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO/ EMC and RADIO Laboratory Manager	
Approvato / Approved by :	Vincenzo La Fragola Direttore generale/ General Manager	

PRIMA RICERCA & SVILUPPO S.r.l.

Sede operativa e Laboratori di prova / Headquarter and Testing lab : Via Campagna, 92 – I-22020 FALOPPIO (CO)

Tel. +39 031 3500 011 – Fax +39 031 9913 09 – info@primaricerca.it – www.primaricerca.it

CONTENUTO / TABLE OF CONTENTS

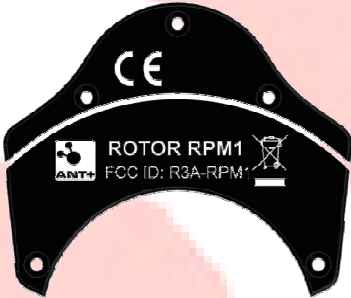
0	RELEASE CONTROL RECORD.....	2
1	TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT).....	3
1.1	EUT Identification	3
1.2	EUT Technical Data	3
1.3	EUT ports identification	5
1.4	Modifications incorporated in E.U.T.	5
1.5	Auxiliary equipment	5
2	REFERENCE STANDARD.....	6
3	OPERATING TEST MODES AND CONDITIONS	6
4	SUMMARY OF TEST RESULTS.....	7
5	TEST RESULTS.....	7
6	LIST OF EQUIPMENT USED.....	12
7	PHOTOGRAPHIC DOCUMENTATION	13

0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_121238-0	Original release	23/11/2012
FCCTR_121238-1	Different model name	28/11/2012

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 EUT Identification

DESCRIPTION :	FORCE/TORQUE MEASUREMENT BATTERY DEVICE INCLUDING RADIO TX/RX 2,4GHZ
TRADEMARK:	ROTOR POWER
MODEL:	
S/N:	
MANUFACTURER:	ROTOR COMPONENTES TECNOLOGICOS SL
COUNTRY OF MANUFACTURER:	SPAIN
COMPOSED BY:	Two units: the first unit sends data to the second unit, the second unit sends data to a remote display or other devices.
EUT DIMENSIONS :	See photographic documentation
EUT STANDING:	On bicycle crank

1.2 EUT Technical Data

POWER SOURCE :	Internal Battery
POWER SUPPLY VOLTAGE:	3V battery (CR2477)
NOMINAL ABSORBED POWER	data not provided by the customer
FCC CLASS:	47 CFR FCC Part 15 Subpart C § 15.249
TYPICAL USAGE :	RADIO EQUIPMENT
TYPE:	INTENTIONAL RADIATOR
OPERATING FREQUENCY BAND	2400-2483.5MHz

FUNDAMENTAL FREQUENCY	2457MHz and 2470MHz
RADIATED OUTPUT POWER	78,9dB μ V/m @ 2457MHz 76,7dB μ V/m @ 2470MHz
FCC ID	R3A-RPM1



1.3 EUT ports identification

This section contains descriptions of all ports, the 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.

Port	Description	Connector	Max cable length
1	Enclosure	Metallic (Bicycle crank)	---
2	AC mains input/output ports	Port not present	---
3	DC mains input/output ports	Internal Battery	---
4	Signals / Control Ports	Port not present	---
5	Telecommunication port	Port not present	---

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

1.4 Modifications incorporated in E.U.T.

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

- None

1.5 Auxiliary equipment

- None

2 REFERENCE STANDARD

CODE OF FEDERAL REGULATIONS	
Title 47 Part 15 Subpart A	Radio frequency devices - General
Title 47 Part 15 Subpart C § 15.249	Radio frequency devices – Intentional Radiators Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
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

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”

3 OPERATING TEST MODES AND CONDITIONS

OPERATING CONDITION	DESCRIPTION
#1	Continuous Data Communication

4 SUMMARY OF TEST RESULTS

Port		Phenomena	Reference Standard	Operating condition	Result
1	Enclosure	Field strength of emissions	Title 47 Part 15 Subpart C § 15.249	#1	Within the limit

5 TEST RESULTS

FIELD STRENGTH OF EMISSIONS.....8

**TEST
1.**

FIELD STRENGTH OF EMISSIONS

**REFERENCE
DOCUMENT**

Title 47 Part 15 Subpart C § 15.249

- **TEST SETUP:** In according to manufacturer specifications
- **TEST LOCATION:** Semi-anechoic chamber (CISPR 16-1 :1993)
Siemens+Matsushita type B84117-D6019-T232
Measure distance 3 meters
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40
Chase Antenna Mod. CBL 6111 C
R&S Antenna HL050
- **TESTED PORT:** Enclosure
- **FREQUENCY RANGE:** 30MHz – to 10th armhonics
- **MEASUREMENT DISTANCE :** 3mt
- **EMISSION LIMITS:** Acc. to Section 15.249 of reference document
- **UNCERTAINTY OF MEASURE:** Level of confidence = 95%
Degree of freedom = 10
Coverage factor $k_p = 2,28$
Combined uncertainty = 4,49 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 :	3V (internal battery)

OPERATING CONDITION (Rif. Section. 3) : #1

RESULT: WITHIN THE LIMIT

LIMIT DEFINITION according to Title 47 Part 15 Subpart C § 15.249:

Operation within the bands 902-928MHz, 2400-2483.5MHz, 5725-5875MHz, and 24.0-24.25GHz

§ 15.249 (a):

the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

§ 15.249 (c):

Field strength limits are specified at a distance of 3 meters.

§ 15.249 (d):

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

§ 15.249 (e)

As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

LIMIT CALCULATION according to Title 47 Part 15 Subpart C § 15.249:

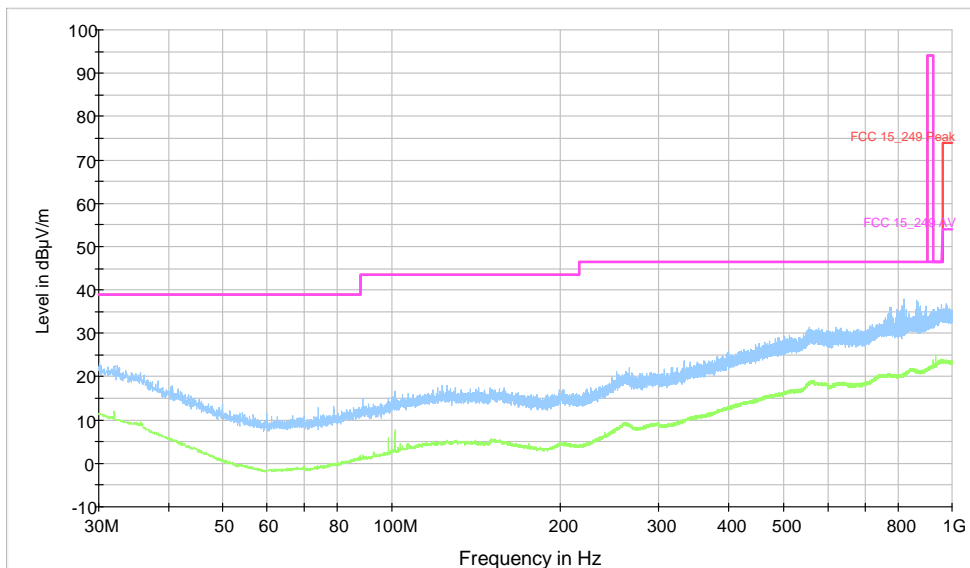
Following § 15.249 (d)

RADIATED OUTPUT POWER	78,9dBµV/m @ 2457MHz 76,7dBµV/m @ 2470MHz
FUNDAMENTAL RADIATED EMISSION LIMITS	94dBµV/m
HARMONICS RADIATED EMISSION LIMITS	54dBµV/m
RADIATED EMISSION LIMITS OUTSIDES SPECIFIED FREQUENCY BANDS	28,9dBµV/m for 2457MHz Fundamental 26,7dBµV/m for 2470MHz Fundamental
GENERAL RADIATED EMISSION LIMITS IN § 15.209	40,0dBµV/m from 30MHz to 88MHz 43,5dBµV/m from 88MHz to 216MHz 43,5dBµV/m from 88MHz to 216MHz 46,5dBµV/m from 216MHz to 960MHz 54dBµV/m above 960MHz

The reference radiated emission limits outside specified frequency bands with the lesser attenuation are the GENERAL RADIATED EMISSION LIMITS IN § 15.209

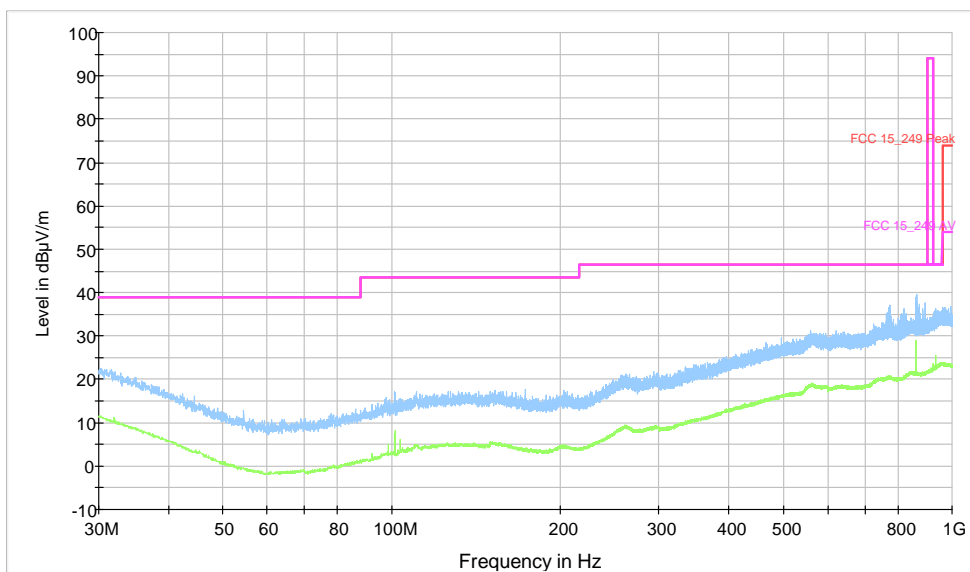
FREQUENCY RANGE: 30MHz – 1GHz
VERTICAL POLARIZATION

Electric Field Strength FCC_OSP



FREQUENCY RANGE: 30MHz – 1GHz
HORIZONTAL POLARIZATION

Electric Field Strength FCC_OSP



**FREQUENCY RANGE: 1GHz to 10th HARMONICS
VERTICAL POLARIZATION**

Freq. Range 1GHz to 10 th HARMONICS							
Freq. Range (GHz)	Freq. (GHz)	Level (dB μ v/m)	Margin (dB)	Limit (dB μ v/m)	Height (cm)	Azimuth (deg)	Notes
1 – 2,4	---	---		54	---	---	No spurious have been detected
2,4 -2,483	2,457	77,1	16,9	94	100	91	Carrier
	2,470	76,7	17,3		100	292	Carrier
2,483 to 10 th HARMONIC	---	---		54	---	---	No spurious have been detected

**FREQUENCY RANGE: 1GHz to 10th ARMHONICS
HORIZONTAL POLARIZATION**

Freq. Range 1GHz to 10 th HARMONICS							
Freq. Range (GHz)	Freq. (GHz)	Level (dB μ v/m)	Margin (dB)	Limit (dB μ v/m)	Height (cm)	Azimuth (deg)	Notes
1 – 2,4	---	---		54	---	---	No spurious have been detected
2,4 -2,483	2,457	78,9	15,1	94	150	160	Carrier
	2,470	75,5	18,5		127	-15	Carrier
2,483 to 10 th HARMONIC	---	---		54	---	---	No spurious have been detected

6 LIST OF EQUIPMENT USED

EQUIPMENT	IDENTIFICATION NUMBER	CAL. DUE	CERTIFICATE NUMBER
EMI TEST RECEIVER 20HZ 40GHZ	EMC.359	AUG.2013	INRIM 11-0490-05
RF SEMI-ANECHOIC CHAMBER (CSSA)	EMC.191	AUG 2013	PRS NSA-2010
BILOG ANTENNA	EMC.023	MAY 2014	SAIBERSDORF EH- A315/11
LOG PERIODICA ANTENNA	EMC.391	DEC 2013	RHODE & S.
VOLTAGE GENERATOR	EMC.397	FEB.2013	SPS A4909D
SPECTRUM ANALYZER	EMC.332	APR.2013	PRS EMC332_2011

7 PHOTOGRAPHIC DOCUMENTATION

PHOTO 1 – EUT IDENTIFICATON



PHOTO 2 – RADIATED EMISSION SETUP

