

RAPPORTO DI PROVA / TEST REPORT

Rif./Ref.No. MPETR_140117-6	Data / Date: 18/09/2014	Pagine / Pages : 10
Scopo delle prove / Test object :	Prove di tipo in accordo a / Type test according to FCC Cfr 47 part 2 - §2.1091, part 1 - §1.1310	
Richiedente / Applicant :	D.F.B. Global certification S.r.l. Via Fiume, 35 – 24030 Paladina (BG) –ITALY Tel. +39 373 7313617	
Persona di riferimento / Applicant's referee :	Sig. Francesco Barbierato (f.barbierato@dfbcert.com)	
Marchio commerciale / Trade mark :		
Fabbricante / Manufacturer :	IVAR S.r.l.	
Prodotto / Product :	WIRELESS PROGRAMMABLE THERMOSTAT	
Tipo / Type :	EQUICALOR-AC	
Codice / Code:	506366US	
FCC ID	2AB4Y506366US	
Data ricevimento campioni / Date of test samples receipt.	07/02/2014	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	07/02/2014	
Sito di prova / Testing site :	Prima Ricerca & Sviluppo Via Campagna - 92 I-22020 FALOPPIO (CO) - ITALY	
Esito delle valutazioni / Assessment results :	CONFORME / COMPLIANT	
Verifiche effettuate da / Verifications carried out by :	Andrea Bortolotti Tecnico di laboratorio / Test Engineer	
Approvato / Approved by :	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO/ EMC and RADIO Laboratory Manager	

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati. / The test results reported in this test report shall refer only to the samples tested

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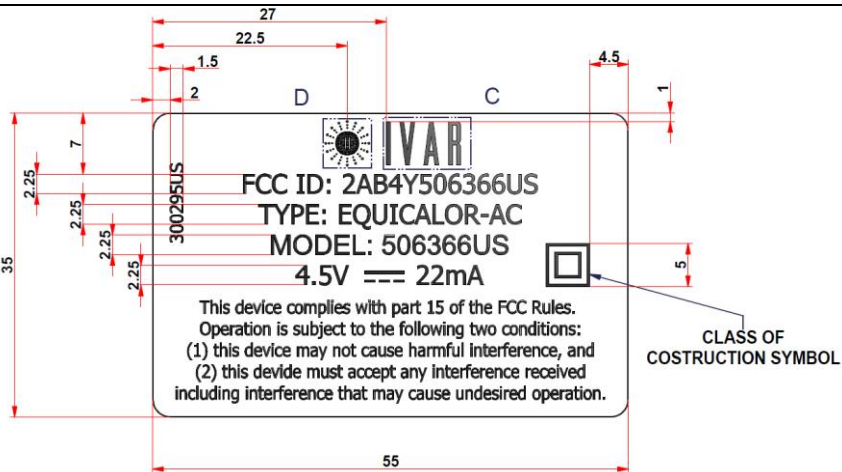
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0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_140117-0	Original Release	13/03/2014
MPETR_140117-1	Added new label + added new FCC ID	14/04/2014
MPETR_140117-2	Correct typing error on antenna model identification	30/07/2014
MPETR_140117-3	Correct radiated power level + added antenna gain	30/07/2014
MPETR_140117-4	Correct calculation error on measurement distance	15/09/2014
MPETR_140117-5	Correct calculation on estimated power density	17/09/2014
MPETR_140117-6	Correct calculation on estimated power density	18/09/2014

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

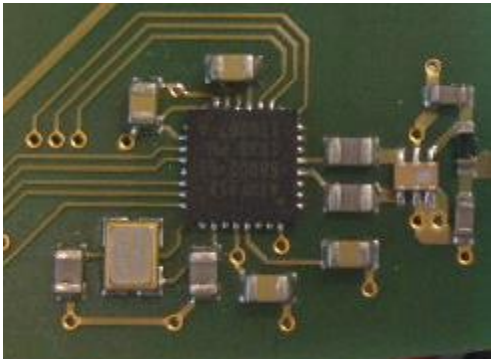

1.1 EUT Identification

TRADEMARK:	 <p> Dimensions: 27, 22.5, 1.5, 2, 7, 2.25, 35, 55, 4.5, 1, 2.25, 2.25, 2.25, 300295US, 52. Labels: D, C, IVAR, FCC ID: 2AB4Y506366US, TYPE: EQUICALOR-AC, MODEL: 506366US, 4.5V == 22mA. Text: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation. CLASS OF COSTRUCTION SYMBOL </p>
MANUFACTURER:	
EUT DESCRIPTION:	
EUT TYPE:	
EUT CODE :	
FCC ID:	
COUNTRY OF MANUFACTURER:	ITALY

1.2 EUT Technical Data

FCC class:	B
Product type:	Radio Equipment
Radio type:	Intentional radiators
Power supply requirements :	4,5 Vdc powered by internal battery (3x1,5V type AA)
Frequency range :	915MHz
Type Modulation :	GFSK
Channel bandwidth:	1.74MHz
Channel spacing:	-----
Antenna Connector /Types :	Integrated

1.3 Technical information

MODULE MANUFACTURER:		
MODULE TYPE:		
TYPE OF ANTENNA:	 <p> Johanson technology mod. 0915AT43A0026 <input checked="" type="checkbox"/> Integral ; <input type="checkbox"/> External ; <input type="checkbox"/> Dedicated </p>	
ANTENNA GAIN:	<p>Average Gain (XZ total): -4.0dBi typ.</p> <p>Peak gain (XZ total): -1.0dBi typ.</p>	

1.4 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	Connection
1	Enclosure	Plastic	Pressure
2	AC Power Supply	Port not present	-----
3	DC power supply	Port not present (internal battery)	-----
4	Signal lines	NA contact	Connector
5	Telecomm. Lines	Port not present	-----
6	Antenna	Port not present (integrated antenna)	-----

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

1.5 EUT modification

- None

1.6 Auxiliary equipment

- None

2 REFERENCE STANDARDS

CODE OF FEDERAL REGULATIONS	
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 § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
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

3 MEASUREMENTS AND CALCULATION RESULTS

3.1 Calculation Method

Far Field Power flux Calculation model.

This model is applicable in the far-field region and over-estimates in the radiating near-field region. The far-field calculations are accurate when the distance, r , from an antenna of length D to a point of investigation is greater than

$$r = \frac{2D^2}{\lambda}$$

The Power Flux is

$$S = \frac{PG}{4\pi r^2} \quad \text{or equivalent} \quad S = \frac{EIRP}{4\pi r^2}$$

where

P = input power of the antenna

G = antenna gain relative to an isotropic antenna

r = distance from the antenna to the point of investigation.

EIRP = Effective Isotropic Radiated Power

3.2 Limits

Tab. 1 of CFR Title 47 Part 1 Subpart I § 1.1310

Table 1—Limits for **Maximum Permissible Exposure (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

f = frequency in MHz

* = Plane-wave equivalent power density

Note 1 to Table 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

3.3 Measurements and Calculation Results

WORST CASE

MEASUREMENTS					
Channel	Frequency (MHz)	Effective Radiated Power (dBm)	Effective Isotropic Radiated Power (dBm)	Effective Isotropic Radiated Power (mW) See note 1	Antenna Gain (dBi) See note 1
1	915.004	-0.91	1.23	1.3	-1.0
Duty cycle factor: 100% (worst case)					
CALCULATION RESULTS (see note 2)					
Distance to the Area of Interest	0.656 feet 0.200 m				
Are Ground Reflections Calculated?	Yes				
Estimated RF Power Density	0.000258 mW/cm ²				
	Controlled Environment	Uncontrolled Environment			
Maximum Permissible Exposure (MPE)	3.055 mW/cm ²	0.615 mW/cm ²			
Does the Area of Interest Appear to be in Compliance?	Yes	Yes			

Note:

¹ The EIRP Radiated measurement include the antenna gain

² The formula reported in par 3.1 has been used for the MPE calculation

4 PHOTOGRAPHIC DOCUMENTATION

PHOTO N°1 – EUT IDENTIFICATION

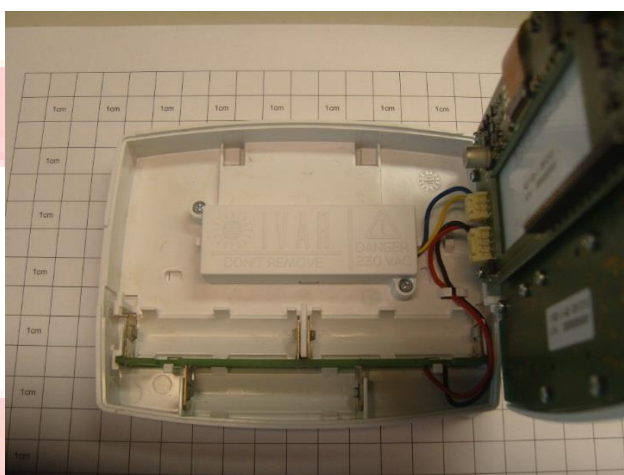


PHOTO N°2 – RADIATED MEASUREMENT SETUP

