



PRIMA

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RAPPORTO DI PROVA / TEST REPORT

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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 :	MUNDO READER, S.L. CALLE SOFIA, 10 P.I EUROPOLIS Las Rozas - Madrid, 28232 Spain	
Persona di riferimento / Applicant's referee :	MR. IVAN GARCIA	
Marchio commerciale / Trade mark :	MUNDO READER	
Fabbricante / Manufacturer :	MUNDO READER, S.L.	
Prodotto / Product :	WIFI MODULE	
Modello / Model :	BQ410	
EUT FCC ID	2AKDW-BQ410	
Data ricevimento campioni / Date of test samples receipt.	February 2017	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	February 2017	
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 :	Enrico Banfi 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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0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_170239-0	Original Release	27/03/2017
MPETR_170239-1	Editorial Change	30/03/2017
MPETR_170239-2	Editorial Change	30/07/2017

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification

Trademark:	MUNDO READER
Manufacturer:	MUNDO READER, S.L.
Type of Equipment :	WiFi Radio module
Model name:	BQ410
Serial number :	prototype
FCC ID :	2AKDW-BQ410
Country of manufacturer:	SPAIN

Technical data

Product type:	Radio Equipment
Radio type:	Intentional radiators
Product description / application	The EUT is 2.4GHz WiFi Transceiver
Power supply requirements :	3,7V (powered by demoboard connected to PC USB port)
Operating Frequency range	2400-2483,5MHz
Operating Frequency:	From 2412MHz to 2462MHz
Channel bandwidth	22MHz
Channel spacing	5MHz
Number of Channel	11 (from 1 to 11)
Type of modulation :	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate:	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 65Mbps
Antenna Type	Integral PCB Printed antenna
Power Control Setting	RF GAIN 21

1.2 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output 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	Not present (electronic PCB board only)	Plug-in electronic board
2	AC Power Supply	Not present	---
3	DC power supply	3.7Vdc	Plug-in electronic board
4	Signal lines	Signal line	Plug-in electronic board
5	Telecomm. Lines	Not present	---
6	Antenna 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.

1.3 Auxiliary equipment

- Evaluation Board used during the session to power supply the EUT and for channel and mode setting

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

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

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)
(B) Limits for General Population/Uncontrolled Exposure				
.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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Note 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

Worst case

Mode	Channel	Frequency (MHz)	EIRP (dBm)	EIRP (W)
b	11	2462	2.79	0.0019

3.4 RF Exposure Evaluation

TX Freq. (MHz)	EIRP (W)	Evaluation distance (m)	Power density at evaluation distance (W/m ²)	FCC Power density Limit (W/m ²)	RESULT
2462	0.0019	0.20	0.0378	10.00	WITHIN THE LIMIT