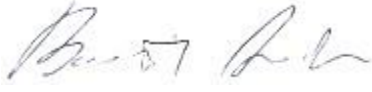




PRIMA

RICERCA & SVILUPPO

RAPPORTO DI PROVA / TEST REPORT

Rif./Ref.No. MPETR_131691-5	Data / Date:08/04/2014	Pagine / Pages : 8
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 :	POWER-ONE ITALY SPA Via San Giorgio 642 – 52028 Terranuova Bracciolini – AR – Italy Tel. +39 055 9195	
Persona di riferimento / Applicant's referee :	Sig. Gianfranco Iannuzzi (gianfranco.iannuzzi@power-one.com)	
Marchio commerciale / Trade mark :		
Fabbricante / Manufacturer :	POWER-ONE ITALY SPA	
Prodotto / Product :	WIFI LOGGER CARD for inverter	
Modello / Model :	WIFI LOGGER CARD identified by the FCC id: X6W-3N16M	
Data ricevimento campioni / Date of test samples receipt.	25/11/2013	
Campioni verificati / No. of tested samples	1	
Data verifiche / Testing date :	28-29/11/2013	
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 :	Andrea Bortolotti Tecnico di laboratorio / Test Engineer	
Approvato / Approved by :	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO/ EMC and RADIO Laboratory Manager	

PRIMARICERCA & SVILUPPO S.r.l.

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

Tel. +39 031 3500011 – Fax +39 031 991309 – info@primaricerca.it – www.primaricerca.it

CONTENUTO / TABLE OF CONTENTS

0	RELEASE CONTROL RECORD.....	2
1	TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT).....	3
	EUT Identification	3
	Technical data	3
1.1	Technical information	4
1.2	EUT ports identification	5
1.3	EUT modification.....	5
1.4	Auxiliary equipment.....	5
2	REFERENCE STANDARDS	6
3	MEASUREMENTS AND CALCULATION RESULTS.....	6
3.1	Calculation Method	6
3.2	Limits.....	7
3.3	Measurements and Calculation Results.....	8

0 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_131691-0	Original Release	27/01/2014
MPETR_131691-1	Added FCC ID	29/01/2014
MPETR_131691-2	Typing error correction	20/02/2014
MPETR_131691-3	Added comments and new calculation results	19/03/2014
MPETR_131691-4	Typographical error correction	28/03/2014
MPETR_131691-5	Editorial change and deleting photographic documentation	08/04/2014

1 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)


EUT Identification

Brand name:	
Manufacturer:	Power-One Italy S.p.A.
Type of Equipment :	WIFI LOGGER CARD for inverter
Model name or number :	WIFI LOGGER CARD identified by the FCC id: X6W-3N16M
Serial number :	200034 VCA.V1E02.0 002
FCC ID :	X6W-3N16M
Country of manufacturer:	Italy

Technical data

FCC class:	§ 15.247
Product type:	Radio Equipment
Radio type:	Intentional radiators
Product description / application	The application is radio module for photovoltaic inverter
Power supply requirements :	12Vdc powered by inverter board
Frequency range :	2400-2483,5MHz
Std 802.11:	IEEE Std 802.11b, 802.11g and 802.11n
Modulation Type:	CCK DQPSK DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS for 802.11b OFDM for 802.11g/n
Transfer Rate	802.11b: 11 / 5.5 / 2 / 1 Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n: 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5 Mbps
RF Output Impedance :	50 Ohms
Channel bandwidth:	20MHz
Channel spacing:	5MHz
Antenna Connector /Types :	RSMA connector

1.1 Technical information

MODULE MANUFACTURER:	MURATA
MODULE TYPE:	Series/Type R078 (WL1801) / D7021
TYPE OF ANTENNA:	<input type="checkbox"/> Integral ; <input checked="" type="checkbox"/> External ; <input type="checkbox"/> Dedicated  <p>EA-79 F 2.4 GHZ Swivel RP-SMA</p>
ANTENNA GAIN:	Max. 3.32dBi (worst case)

1.2 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	Not present (electronic PCB board only)	Plug-in electronic board
2	AC Power Supply	Not present (electronic PCB board only)	-----
3	DC power supply	12Vdc	Plug-in electronic board
4	Signal lines	Signal line	Plug-in electronic board
5	Telecomm. Lines	Not present (electronic PCB board only)	-----
6	Antenna	RSMA connector	Connector

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 EUT modification

- None

1.4 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)
(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 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	Protocol	TX Frequency (MHz)	Conducted Power at RP-SMA connector (dBm)	Conducted Power at RP-SMA connector (mW)	Antenna Gain (dBi)
11	b	2462	19.33	85.7	3.32
Duty cycle factor: 100%					
CALCULATION					
Distance to the Area of Interest			0.656feet 20cm		
Are Ground Reflections Calculated?			NO		
Estimated RF Power Density			0.0367 mW/cm2		
			Uncontrolled Environment		
Maximum Permissible Exposure (MPE)			1.000 mW/cm2		
Distance to Compliance From Centre of Antenna			0.1253 feet 0.0382 m		
Does the Area of Interest Appear to be in Compliance?			Yes		
RESULT					
EUT is Compliant with the requirements of FCC rule part 2.1091					