

TEST REPORT

Applicant	Particle Industries, Inc
Address	126 Post St, 4th floor, San Francisco, CA 94108 USA

Manufacturer or Supplier	Particle Industries, Inc	
Address	126 Post St, 4th floor, San Francisco, CA 94108 USA	
Product	Boron 2G/3G	
Brand Name	Particle Industries, Inc	
Model	BRN310	
Additional Model & Model Difference	N/A	
Date of tests	Sep. 03, 2018 ~ Nov. 08, 2018	

The submitted sample of the above equipment has been tested according to the requirements of the following standard:

EN 62311:2008

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Breeze Jiang
Project Engineer / EMC Department

Approved by Glyn He
Supervisor / EMC Department




Date: Dec. 10, 2018

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



Test Report No.: SE180831N010-1

TABLE OF CONTENTS

TEST REPORT	1
RELEASE CONTROL RECORD.....	3
1. GENERAL INFORMATION	4
1.1 GENERAL DESCRIPTION OF EUT.....	4
2. RF EXPOSURE MEASUREMENT	4
2.1 INTRODUCTION	5
2.2 LIMIT.....	5
2.3 CLASSIFICATION OF THE ASSESSMENT METHODS.....	5
2.4 TEST RESULTS	6



Test Report No.: SE180831N010-1

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SE180831N010-1	Original release	Dec. 10, 2018

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Boron 2G/3G
MODEL NO.	BRN310
ADDITIONAL MODEL	N/A
NOMINAL VOLTAGE	Li+ PIN /Battery connector: DC 3.7V from Li-ion Battery or VUSB PIN /USB connector :DC 5V from USB Host Unit
OPERATING TEMPERATURE RANGE	-20 ~ +80°C
MODULATION TECHNOLOGY	DSSS(IEEE 802.15.4)
MODULATION TYPE	OQPSK
OPERATING FREQUENCY	2405-2480MHz
EIRP POWER	-0.77dBm (Measured Max.)
ANTENNA TYPE	PCB Antenna, 0dBi Gain

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 180831N010) for detailed product photo.
4. The EUT is wireless module, it no any accessories.
5. The EUT have SISO function, provides 1 completed transmitters and 1 receivers.

MODULATION MODE	TX FUNCTION
DSSS	1TX/1RX

2. RF EXPOSURE MEASUREMENT

2.1 INTRODUCTION

This International Standard applies to electronic and electrical equipment for which no dedicated product- or product family standard regarding human exposure to electromagnetic fields applies.

The frequency range covered is 0 Hz to 300 GHz.

The object of this generic standard is to provide assessment methods and criteria to evaluate such equipment against basic restrictions or reference levels on exposure of the general public related to electric, magnetic and electromagnetic fields and induced and contact current.

2.2 LIMIT

According to EN 62311: 2008, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified 1999/519/EC.

FREQUENCY RANGE (GHz)	E-FIELD STRENGTH (V/m)
2 ~ 300	61

2.3 CLASSIFICATION OF THE ASSESSMENT METHODS

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user. Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the WLAN easy install sheet. So, this product under normal use is located on electromagnetic far field between the human body.

Far Field Calculation Formula

$$E = \eta_0 H = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

G = antenna gain relative to an isotropic antenna
 θ, ϕ = elevation and azimuth angles to point of investigation
 r = distance from observation point to the antenna
 η_0 = Characteristic impedance of free space



2.4 TEST RESULTS

CALCULATION FOR MAXIMUM E.I.R.P.

Output Power E.I.R.P. (dBm)	Output Power E.I.R.P. (mW)	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	PASS / FAIL
-0.77	0.83753	0.7926	61.00	PASS