

## 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	
Model	BRN310	
Additional Model & Model Difference	BRN314; see items 1.1	
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 62311:2020
- EN 50665:2017

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

<p>Tested by Breeze Jiang Senior Project Engineer / EMC Department</p>	<p>Approved by Glyn He Assistant Manager / EMC Department</p>
	 <p>Date: Dec. 28, 2020</p>

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Test Report No.: SE2012WDG0026-1

### RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SE180831N010-1	Original release	Dec. 10, 2018
SE2012WDG0026-1	Based on the original report SE180831N010-1 added standard EN50665 and additional model, changed the brand name, but it doesn't need to be retested.	Dec. 28, 2020

## 1. GENERAL INFORMATION

### 1.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Boron 2G/3G
<b>MODEL NO.</b>	BRN310
<b>ADDITIONAL MODEL</b>	BRN314
<b>NOMINAL VOLTAGE</b>	Li+ PIN /Battery connector: DC 3.7V from Li-ion Battery or VUSB PIN /USB connector :DC 5V from USB Host Unit
<b>OPERATING TEMPERATURE RANGE</b>	-20 ~ +80°C
<b>MODULATION TECHNOLOGY</b>	DSSS(IEEE 802.15.4)
<b>MODULATION TYPE</b>	OQPSK
<b>OPERATING FREQUENCY</b>	2405-2480MHz
<b>EIRP POWER</b>	-0.77dBm (Measured Max.)
<b>ANTENNA TYPE</b>	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.: 2012WDG0026) for detailed product photo.
4. Additional model BRN314 is identical with the test model BRN310 except the model name for trading purpose.
5. The EUT is wireless module, it no any accessories.
6. The EUT have SISO function, provides 1 completed transmitters and 1 receivers.

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>DSSS</b>	<b>1TX/1RX</b>

## 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, 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  
 $\theta, \phi$  = elevation and azimuth angles to point of investigation  
 r = distance from observation point to the antenna  
 $\eta_0$  = 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