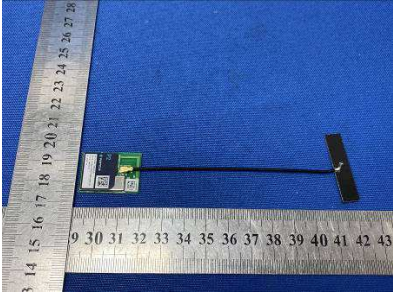


## TEST REPORT

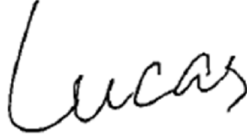

Applicant	Particle Industries, Inc
Address	325 9th Street, San Francisco, CA 94103 United States

Manufacturer or Supplier	Particle Industries, Inc	
Address	325 9th Street, San Francisco, CA 94103 United States	
Product	Wi-Fi Module	
Brand Name	Particle	
Model	P2	
Additional Model & Model Difference	N/A	
Date of tests	Feb. 21, 2021 ~ Apr. 06, 2022	

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

- EN IEC 62311:2020
- EN 50665:2017

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

Tested by Lucas Chen Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	
Date: Jul. 18, 2022	

This report is governed by, and incorporates by reference, the Conditions of Testing 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. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. 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.: SE2207WDG0104-2

## TABLE OF CONTENTS

TEST REPORT .....	1
RELEASE CONTROL RECORD.....	3
<b>1. GENERAL INFORMATION .....</b>	<b>4</b>
1.1 GENERAL DESCRIPTION OF EUT.....	4
<b>2. RF EXPOSURE MEASUREMENT .....</b>	<b>5</b>
2.1 INTRODUCTION .....	6
2.2 LIMIT.....	6
2.3 CLASSIFICATION OF THE ASSESSMENT METHODS.....	6
2.4 TEST RESULTS .....	7



Test Report No.: SE2207WDG0104-2

### RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SE2202WDG0092-2	Original release	May 19, 2022
SE2207WDG0104-2	Based on the original report SE2202WDG0092-2 updated the label, but it doesn't need to be retested.	Jul. 18, 2022

## 1. GENERAL INFORMATION

### 1.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Wi-Fi Module
<b>MODEL NO.</b>	P2
<b>ADDITIONAL MODEL</b>	N/A
<b>NOMINAL VOLTAGE</b>	DC 3.3V
<b>OPERATING TEMPERATURE RANGE</b>	-20 ~ +70°C
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>OPERATING FREQUENCY</b>	2.4GHz WIFI: 2412-2472MHz for 11b/g/n(HT20) 5GHz WIFI: 5180 ~ 5240MHz, 5260 ~ 5320MHz 5500 ~ 5700MHz, 5745 ~ 5825MHz for Band1/2/3/4
<b>EIRP POWER</b>	19.80dBm For WIFI 2.4G 20.87dBm For WIFI 5G Band 1/2/3 13.47dBm For WIFI 5G Band 4
<b>ANTENNA TYPE</b>	WIFI 2.4G PCB Antenna, with 2.41dBi gain External PCB Antenna, with 1.55dBi gain 5180 ~ 5240MHz: PCB antenna with 1.28dBi gain External PCB antenna with -0.32dBi gain 5260 ~ 5320MHz: PCB antenna with 1.60dBi gain External PCB antenna with -0.08dBi gain 5500 ~ 5700MHz: PCB antenna with 1.74dBi gain External PCB antenna with 0.87dBi gain 5745 ~ 5825MHz for Band4: PCB antenna with 1.21dBi gain External PCB antenna with 1.26dBi gain

#### NOTES:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
- Please refer to the EUT photo document (Reference No.:2207WDG0104) for detailed product photo.

4. The Wi-Fi Module uses two antennas, but couldn't transmit simultaneously, only the antenna type and gain are different.
5. The EUT provides completed transmitters and receivers, the EUT uses only one antenna at any time.

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>802.11b</b>	1TX/1RX
<b>802.11g</b>	1TX/1RX
<b>802.11n (HT20)</b>	1TX/1RX

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>802.11a</b>	1TX/1RX
<b>802.11n (HT20), 802.11ac (VHT20)</b>	1TX/1RX
<b>802.11n (HT40), 802.11ac (VHT40)</b>	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 IEC 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
19.80 for 2.4GHz WIFI	95.499	8.463	61.00	PASS
20.87 for 5GHz WIFI (Band 1/2/3)	122.180	9.573	61.00	PASS
13.47 for 5GHz WIFI (Band 4)	22.233	4.083	61.00	PASS

**Note:** This device couldn't transmit simultaneously in WIFI 2.4G and 5G.