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Test Report No.: W7L-P23030011RI02



# VARIANT IC TEST REPORT

## (RSS-133)

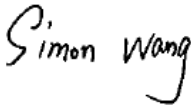

Applicant:	Particle Industries, Inc
Address:	325 9th Street, San Francisco, CA 94103, United States Of America

Manufacturer or Supplier:	Particle Industries, Inc
Address:	325 9th Street, San Francisco, CA 94103, United States Of America
Product:	E Series Module
Brand Name:	Particle
Model Name:	E404X
IC:	20127-E404X
Date of tests:	Mar. 10, 2023 ~ Mar. 24, 2023

The tests have been carried out according to the requirements of the following standard:

- RSS-133 Issue 6, Amendment 1, January, 2018**
- RSS-Gen Issue 5, Amendment 1, March 2019**
- ANSI C63.26-2015**

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

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Mar. 24, 2023	Date: Mar. 24, 2023

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.



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P22110028RI02	Original release	Dec. 08, 2022
W7L-P23030011RI02	Based on the original product change components and hardware version, it doesn't affect RF Function, The new sample no change data.	Mar. 24, 2023



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: IC RSS-133 & RSS-Gen		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
RSS-GEN		
6.7	Occupied Bandwidth	See Note
6.8	Transmit antenna	See Note
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
RSS-133		
6.3	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature	See Note
6.4	Maximum Peak Output Power	See Note
6.4	peak-to-average power ratio	See Note
6.5	Band Edge Measurements	See Note
6.5	Conducted Spurious Emissions	See Note
6.5	Transmitter Radiated Spurious Emissions	See Note
6.6	Receive Spurious Emissions	See Note

**NOTE:** Please refer to the original report W7L-P22110028EM02, IC: 20127-E404X.



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	E Series Module	
<b>BRAND NAME</b>	Particle	
<b>MODEL NAME</b>	E404X	
<b>NOMINAL VOLTAGE</b>	5.0Vdc(adapter or host equipment) 3.8Vdc (Li-ion, battery)	
<b>MODULATION TYPE</b>	LTE Band 2: QPSK, 16QAM	
<b>FREQUENCY RANGE</b>	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~ 1909.3MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5MHz ~ 1908.5MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~ 1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855.0MHz ~ 1905.0MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5MHz ~ 1902.5MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860.0MHz ~ 1900.0MHz
<b>MAX. EIRP POWER</b>	LTE Band 2 Channel Bandwidth: 1.4MHz	445.66mW
	LTE Band 2 Channel Bandwidth: 3MHz	444.63mW
	LTE Band 2 Channel Bandwidth: 5MHz	443.61mW
	LTE Band 2 Channel Bandwidth: 10MHz	445.66mW
	LTE Band 2 Channel Bandwidth: 15MHz	444.63mW
	LTE Band 2 Channel Bandwidth: 20MHz	448.75mW



<b>EMISSION DESIGNATOR</b>	<b>LTE Band 2 Channel Bandwidth: 1.4MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
	<b>LTE Band 2 Channel Bandwidth: 3MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
	<b>LTE Band 2 Channel Bandwidth: 5MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
	<b>LTE Band 2 Channel Bandwidth: 10MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
	<b>LTE Band 2 Channel Bandwidth: 15MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
	<b>LTE Band 2 Channel Bandwidth: 20MHz</b>	QPSK: 1M12G7D 16QAM: 974KW7D
<b>ANTENNA TYPE</b>	External Antenna(KIT) with 3.86dBi gain for LTE B2 External Antenna(Taoglas) with 3.5dBi gain for LTE B2	
<b>HW VERSION</b>	v1.0.0	
<b>SW VERSION</b>	V4.0.0	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE SUPPLIED</b>	N/A	
<b>EXTREME TEMPERATURE</b>	-40-75 °C	
<b>EXTREME VOLTAGE</b>	3.3V – 4.3V	

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- Sample Information:

Sample Number	Description
Sample 1	Main test Sample(U11:TI - bq24195, U12:Richtek -RT5760CHGH6F)
Sample 2	Based on Sample 1 changed U11 to TI - bq24190
Sample 3	Based on Sample 1 changed U12 to TI - TLV62568
Sample 4	Based on Sample 1 changed U12 to MPS - MP1601GTF-Z

Note: Full testing was performed by sample 1, other samples verified the worst case of RSE, Only the worst case data(Sample 1) was reported.



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**Test Report No.: W7L-P23030011R102**

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## 2.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**Canada RSS-133, Issue 6, Amendment 1, January 2018**

**Canada RSS-Gen, Issue 5, Amendment 1, March 2019**

**ANSI C63.26 - 2015**

**NOTE:** All test items have been performed and recorded as per the above standards.

## 2.3 TRANSMIT ANTENNA

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

Antenna Type	External Antenna(KIT)/ External Antenna(Taoglas)
Antenna Gain	External Antenna(KIT) 3.86dBi gain for LTE B2 External Antenna(Taoglas) 3.5dBi gain for LTE B2
Impedance	50 $\Omega$





Test Report No.: W7L-P23030011R102

### 3 INFORMATION ON THE TESTING LABORATORIES

We, BV 7Layers Communications Technology (Shenzhen) Co. Ltd, were founded in 2015 to provide our best service in EMC, Radio, and Telecom. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Shenzhen EMC/RF Lab:**

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**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site also.



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## 4 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---