VARIANT IC TEST REPORT
(RSS-139)

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-139 Issue 4, September 29, 2022**
☒ **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
Simon Wang Date: Mar. 24, 2023	Luke Lu Date: Mar. 24, 2023

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P22110028RI03	Original release	Dec. 08, 2022
W7L-P23030011RI03	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-139, RSS-Gen		
STANDARD SECTION RSS-Gen	**TEST TYPE AND LIMIT**	**RESULT**
6.7	Occupied Bandwidth	See Note
6.8	Transmit antenna	See Note
STANDARD SECTION RSS-139	**TEST TYPE AND LIMIT**	**RESULT**
6.4	Frequency Stability AFC Freq. Error vs. Voltage AFC Freq. Error vs. Temperature	See Note
6.5	Maximum Peak Output Power	See Note
6.5	peak-to-average power ratio	See Note
6.6	Band Edge Measurements	See Note
6.6	Conducted Spurious Emissions	See Note
6.6	Radiated Spurious Emissions	See Note
6.7	Transmitter Power Control	See Note

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT	E Series Module	
BRAND NAME	Particle	
MODEL NAME	E404X	
POWER SUPPLY	5.0Vdc(adapter or host equipment) 3.8Vdc (Li-ion, battery)	
MODULATION TECHNOLOGY	**LTE**	QPSK, 16QAM
FREQUENCY RANGE	**LTE Band 4 Channel Bandwidth: 1.4MHz**	1710.7MHz ~ 1754.3MHz
	LTE Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz
	LTE Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~ 1750.0MHz
	LTE Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5MHz
	LTE Band 4 Channel Bandwidth: 20MHz	1720.0MHz ~ 1745.0MHz
EMISSION DESIGNATOR	**LTE Band 4 Channel Bandwidth: 1.4MHz**	QPSK: 1M13G7D
		16QAM: 974KW7D
	LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 1M13G7D
		16QAM: 974KW7D
	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 1M13G7D
		16QAM: 974KW7D
	LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 1M13G7D
		16QAM: 974KW7D
	LTE Band 4 Channel Bandwidth: 15MHz	QPSK: 1M13G7D
		16QAM: 974KW7D
	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 1M13G7D
		16QAM: 974KW7D
MAX. ERP/EIRP POWER	**LTE Band 4 Channel Bandwidth: 1.4MHz**	435.51mW
	LTE Band 4 Channel Bandwidth: 3MHz	433.51mW
	LTE Band 4 Channel Bandwidth: 5MHz	434.51mW

	LTE Band 4 Channel Bandwidth: 10MHz	434.51mW
MAX. ERP/EIRP POWER	**LTE Band 4 Channel Bandwidth: 15MHz**	437.52mW
	LTE Band 4 Channel Bandwidth: 20MHz	438.53mW
ANTENNA TYPE	External Antenna(KIT) with 3.86 gain for LTE4 External Antenna(Taoglas) with 3.5gain for LTE4	
HW VERSION	v1.0.0	
SW VERSION	V4.0.0	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-40-75 ℃	
EXTREME VOLTAGE	3.3V – 4.3V	

NOTE:

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

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. 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.

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-139, Issue 4, September 29, 2022

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	Internal Antenna 3.86dBi gain for LTE B4 Magnet mount antenna 3.5dBi gain for LTE B4
Impedance	50 Ω

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:

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

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

No modifications were made to the EUT by the lab during the test.

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