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VERITAS

Test Report No.: IM200518N028

# RF EXPOSURE 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	Tracker SoM LTE M1
Brand Name	Particle
Model	T402M
Additional Model & Model Difference	T404M, see items 3.1 note
Date of tests	May 18, 2020 ~ Jul. 18, 2020

IC RSS-102 Issue 5

IEEE C95.3

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

Tested by Breeze Jiang  
Senior Project Engineer / EMC Department

Approved by Glyn He  
Assistant Manager / EMC Department

Date: Aug. 14, 2020

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## TABLE OF CONTENTS

RELEASE CONTROL RECORD .....	3
1. CERTIFICATION.....	4
2. RF EXPOSURE LIMIT .....	5
3. MPE CALCULATION FORMULA.....	5
4. CLASSIFICATION .....	5
5. ANTENNA GAIN .....	6
6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER.....	6



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
IM200518N028	Original release	Aug. 14, 2020

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## 1. CERTIFICATION

<b>IC:</b>	20127-T40X
<b>PRODUCT:</b>	Tracker SoM LTE M1
<b>BRAND NAME:</b>	Particle
<b>MODEL NO.:</b>	T402M
<b>ADDITIONAL NO.:</b>	T404M
<b>TEST SAMPLE:</b>	Engineering Sample
<b>APPLICANT:</b>	Particle Industries, Inc
<b>STANDARDS:</b>	IC RSS-102 Issue 5
	IEEE C95.3

Note: Additional model T404M is identical with the test model T402M except the model number for marketing purpose.



## 2. RF EXPOSURE LIMIT

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (W/m <sup>2</sup> )	AVERAGE TIME (minutes)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
48-300	22.06	0.05852	1.291	6
300-6000	3.142*F <sup>0.3417</sup>	0.008335*F <sup>0.3417</sup>	0.02619*F <sup>0.6834</sup>	6

F = Frequency in MHz

## 3. MPE CALCULATION FORMULA

$$Pd = (Pout * G) / (4 * pi * r^2)$$

where

Pd = power density in W/m<sup>2</sup>

Pout = output power to antenna in W

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in m

## 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.



### 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit	Peak Gain (dBi)	Antenna Type
Wi-Fi 2.4GHz	2	FPCB Antenna
BT 2.4GHz	2	FPCB Antenna
	0	Ceramic Antenna
LTE	3.77	External Antenna

### 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

The tuned conducted Average Power (declared by client)

Mode	Target Power (dBm)	Tolerance (dBm)	Lower Tolerance (dBm)	Upper Tolerance (dBm)
802.11b	16	+/-1	15	17
802.11g	15	+/-1	14	16
802.11n(HT20)	15	+/-1	14	16
802.11n (HT40)	15	+/-1	14	16
BT-LE (GFSK)	8	+/-1	7	9
LTE	24	+/-1	23	25

The measured conducted Average Power

Mode	Frequency (MHz)	Averaged Power (dBm)
802.11b	2437	16.83
802.11g	2412	15.71
802.11n(HT20)	2412	15.54
802.11n HT40	2412	15.61
BT-LE (GFSK)	2402	7.81
LTE	Band 25	24.5

FREQUENCY BAND (MHz)	MAX AVERAGE POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (m)	POWER DENSITY (W/m <sup>2</sup> )	LIMIT (W/m <sup>2</sup> )
BT 2.4GHz	9	2	0.2	0.02505	5.47
Wi-Fi 2.4GHz	17	2	0.2	0.15803	5.47
LTE	25	3.77	0.2	1.49875	5.47



**CONCLUSION:**

The BT and WLAN can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

**CPD = Calculation power density**

**LPD = Limit of power density**

$(0.02505/5.47) + (0.15803/5.47) + (1.49875/5.47) = 0.30746 < 1$ , which is less than the "1" limit.

--- END ---