



BUREAU
VERITAS

Test Report No.: FM2011WDG0365

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 | B Series |
| Brand Name | Particle |
| Model | B402 |
| Additional Model & Model Difference | B404 ; See items 1 |
| Date of tests | Jun. 04, 2019 ~ Jul. 03, 2019 |

- FCC Part 2 (Section 2.1091)
- KDB 447498 D01
- IEEE C95.1

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: Jan. 12, 2021 |
|---|--|

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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---------------|--|---------------|
| FM190604N039 | Original release | Jul. 18, 2019 |
| FM2011WDG0365 | Based on the original report FM190604N039 changed the product name and model, added brand name | Jan. 12, 2021 |

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1. CERTIFICATION

PRODUCT: B Series
BRAND NAME: Particle
MODEL NO.: B402
ADDITIONAL MODEL: B404
FCC ID: 2AEMI-B402
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Particle Industries, Inc
TESTED DATES: Jun. 04, 2019 ~ Jul. 03, 2019
STANDARDS: FCC Part 2 (Section 2.1091)
KDB 447498 D01
IEEE C95.1



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 (mW/cm ²) | AVERAGE TIME (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE | | | | |
| 300-1500 | ... | ... | F/1500 | 30 |
| 1500-100,000 | ... | ... | 1.0 | 30 |

F = Frequency in MHz

3. MPE CALCULATION FORMULA

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

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

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:

| Frequency Band | Antenna Gain (dBi) | Antenna Type |
|----------------|--------------------|--------------|
| BT-LE (GFSK) | 2.00 | FPCB Antenna |
| LTE(Band 2) | 3.50 | FPCB Antenna |
| LTE(Band 4) | 3.50 | FPCB Antenna |
| LTE(Band 5) | 1.00 | FPCB Antenna |
| LTE(Band 12) | 1.00 | FPCB Antenna |
| LTE(Band 13) | 1.00 | FPCB Antenna |

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

TUNE-UP POWER TABLE

| Band | Frequency (MHz) | Operating Mode | Tune-Up Power And Tolerance (dBm) |
|--------|-----------------|----------------|-----------------------------------|
| BT-LE | 2402 | GFSK(1Mbps) | -4.0 |
| LTE 2 | 1880 | QPSK | 24.8 |
| LTE 4 | 1732.5 | QPSK | 25.0 |
| LTE 5 | 836.5 | QPSK | 25.0 |
| LTE 12 | 707.5 | QPSK | 25.0 |
| LTE 13 | 782 | QPSK | 25.0 |

BT

| Band | Frequency (MHz) | Operating Mode | Antenna Gain (dBi) | Tune-up Power (dBm) | E.I.R.P Power (mW) | Power Density (mW/cm ²) | limit (mW/cm ²) | PASS / FAIL |
|------|-----------------|----------------|--------------------|---------------------|--------------------|-------------------------------------|-----------------------------|-------------|
| BTLE | 2402 | GFSK | 2 | -4.0 | 0.63 | 0.000126 | 1.00 | PASS |

LTE

| Band | Frequency (MHz) | Operating Mode | Antenna Gain (dBi) | Tune-up Power (dBm) | E.I.R.P Power (mW) | Power Density (mW/cm ²) | limit (mW/cm ²) | PASS / FAIL |
|---------|-----------------|----------------|--------------------|---------------------|--------------------|-------------------------------------|-----------------------------|-------------|
| Band 2 | 1880 | QPSK | 3.50 | 24.80 | 676.083 | 0.135 | 1.00 | PASS |
| Band 4 | 1720 | QPSK | 3.50 | 25.00 | 707.946 | 0.141 | 1.00 | PASS |
| Band 5 | 829 | QPSK | 1.00 | 25.00 | 398.107 | 0.079 | 0.56 | PASS |
| Band 12 | 707.5 | QPSK | 1.00 | 25.00 | 398.107 | 0.079 | 0.47 | PASS |
| Band 13 | 782.0 | QPSK | 1.00 | 25.00 | 398.107 | 0.079 | 0.52 | PASS |

CONCLUSION:

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

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

CPD = Calculation power density

LPD = Limit of power density

$$(0.000126/1)+(0.141/1) = 0.141126 < 1, \text{ which is less than the "1" limit.}$$

--- END ---