



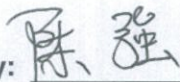
中国认可  
国际互认  
检测  
TESTING  
CNAS L4963

# MPE REPORT

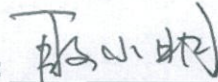
Report No. 2017SAR233

FCC ID: 2AHRH-FJ1000LT  
Applicant: Positioning Universal Inc  
Product: GPS Tracker  
Model: FJ1000LT  
HW Version: P1.0  
SW Version: LR4.3.4.1-29555  
Issue Date: 2017-06-05

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(Technical Manager)



**Remark:** This report details the results of the testing carried out on the samples specified in this report, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. The report shall not be reproduced except in full, without written approval of the Company.

|                        |                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| Applicable<br>Standard | <b>FCC RULES 47 CFR2.1091:</b><br>Radiofrequency radiation exposure evaluation: mobile device |
| Test Results           | Pass                                                                                          |

**Change History**

| Version | Change Contents | Author     | Date       |
|---------|-----------------|------------|------------|
| V1.0    | First edition   | Chen Qiang | 2017-06-05 |
|         |                 |            |            |
|         |                 |            |            |
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|         |                 |            |            |

**Note: The last version will be invalid automatically while the new version is issued.**

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## **1. Test Laboratory**

### **1.1 Testing Location:**

Company: Shanghai Tejet Communications Technology Co., Ltd Testing Center.  
Address: Room 6205-6208, Building 6, No.399 Cailun Rd. Zhangjiang Hi-Tech Park,  
Shanghai, China  
Post Code : 210203  
Tel: +86-21-61650880  
Fax: +86-21-61650881  
Website: [www.tejet.cn](http://www.tejet.cn)

### **1.2 Laboratory Environment**

|                   |                |
|-------------------|----------------|
| Temperature       | 20° C ~ 25 ° C |
| Relative humidity | 20% ~ 70%      |

### **1.3 Testing date**

Test start date: 2017-5-17  
Test end date: 2017-5-17

## **2. Client Information**

### **2.1 Applicant information**

Company Name: Positioning Universal Inc  
Address: 4660 La Jolla Village Drive Suite 1100, San Diego,CA 92122  
United States  
Contact : Ezra T Peachey  
Email: timp@positioninguniversal.com  
Tel: 8583428458  
Fax: 7347586790

### **2.2 Manufacturer Information**

Company Name: Fujiao Communications  
Address: 1802 room ,zhongshanwest road 2368, xuhui district,  
Shanghai ,China  
Contact : zihao.tang  
Email: Zihao Tang (zhtang@163.com)  
Tel: 021-51685536  
Fax: /

### 3. Equipment Under Test (EUT) and Accessory Equipment (AE)

#### 3.1 Information of EUT

|                                 |                                                 |           |
|---------------------------------|-------------------------------------------------|-----------|
| Device type                     | Initial model                                   |           |
| Product name                    | GPS Tracker                                     |           |
| Device operation configuration: |                                                 |           |
| IMEI or S/N                     | /                                               |           |
| Operating mode(s):              | LTE Band 2                                      |           |
|                                 | LTE Band 4                                      |           |
|                                 | LTE Band 12                                     |           |
| Rated output power              | LTE Band 2/4/12:24dBm                           |           |
| Operating frequency range(s):   | Band                                            | Tx(MHz)   |
|                                 | LTE Band 2                                      | 1850~1910 |
|                                 | LTE Band 4                                      | 1710~1755 |
|                                 | LTE Band 12                                     | 698~716   |
| Power class                     | LTE Band 2/4/12: test with maximum output power |           |

## 4. Reference Documents

### 4.1 Reference Documents for testing

The MPE report was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2.1091.

The limits standard is based on the Council Recommendation 1999/519/EC. FCC CFR 47, Part 2, FREQUENCY ALLOCATION AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS, Oct 1, 2011

Section 2.1091 Radiofrequency radiation exposure evaluation: mobile device, Oct 1, 2011

### 4.2 RF Exposure Limit

Systems operating under the provision of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

**Table 1. FCC Limits for Maximum Permissible Exposure (MPE)**

#### (B) Limits for General Population/Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------------|-------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                  | 30                                                                |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f <sup>2</sup> )*                  | 30                                                                |
| 30-300                | 27.5                              | 0.073                             | 0.2                                     | 30                                                                |
| 300-1500              | --                                | --                                | f/1500                                  | 30                                                                |
| 1500-100,000          | --                                | --                                | 1.0                                     | 30                                                                |

f = frequency in MHz

\*Plane-wave equivalent power density

The maximum permissible exposure for LTE and 2/4/12 is.

| BAND       | The maximum permissible exposure |
|------------|----------------------------------|
| LTE Band 2 | <b>1 W/ m<sup>2</sup></b>        |

|             |                        |
|-------------|------------------------|
| LTE Band 4  | 1 W/ m <sup>2</sup>    |
| LTE Band 12 | 0.47 W/ m <sup>2</sup> |

## 5. Friis Formula

Friis transmission formula :  $P_d = (P_{out} * G) * DutyFactor / (4 * \pi * r^2)$

where

**Pd** = power density in **mW/cm<sup>2</sup>**

**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**

Pd is the limit of MPE. If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the MPE value at distance 20cm.

LTE FDD Duty Factor=1

## 6. Classification

The product under normal use condition is at least 20cm away from the body of the user.

So, this device is classified as Mobile Device.

## 7. Maximum Power

| Mode |         | Maximum Power (dBm) |
|------|---------|---------------------|
| LTE  | Band 2  | 24                  |
|      | Band 4  | 24                  |
|      | Band 12 | 24                  |

From the antenna specifications provide by the applicant, the antenna gain 1.51 dBi in LTE Band 2 ,and the antenna gain 1.42dBi in LTE Band 4, the antenna gain 1.23 dBi in LTE Band 12.

So for conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

## 7.2 Output Power Into Antenna & RF Exposure value at distance 20cm

| Frequency band     | Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Duty fator | The maximum sourced based time-averaged transmit power(mW) | Calculated RF Exposure | Limit (mW/ cm <sup>2</sup> ) |
|--------------------|--------------------|------------------------|-------------------------|------------------------|------------|------------------------------------------------------------|------------------------|------------------------------|
| <b>LTE Band 2</b>  | 1.51               | 1.42                   | 24                      | 251.19                 | 1          | 251.19                                                     | 0.071                  | <b>1</b>                     |
| <b>LTE Band 4</b>  | 1.42               | 1.39                   | 24                      | 251.19                 | 1          | 251.19                                                     | 0.069                  | <b>1</b>                     |
| <b>LTE Band 12</b> | 1.23               | 1.33                   | 24                      | 251.19                 | 1          | 251.19                                                     | 0.066                  | <b>0.47</b>                  |

$$\begin{aligned}
 \text{For LTE Band 2 , Pd} &= (\text{Pout} * \text{G}) * \text{DutyFactor} / (4 * \text{Pi} * \text{r}^2) \\
 &= (251.19 * 1.42) * 1 / (4 * 3.1416 * 20^2) \\
 &= 0.071(\text{mW/ cm}^2)
 \end{aligned}$$

$$\begin{aligned}
 \text{For LTE Band 4 , Pd} &= (\text{Pout} * \text{G}) * \text{DutyFactor} / (4 * \text{Pi} * \text{r}^2) \\
 &= (251.19 * 1.39) * 1 / (4 * 3.1416 * 20^2) \\
 &= 0.069(\text{mW/ cm}^2)
 \end{aligned}$$

$$\begin{aligned}
 \text{For LTE Band 12 , Pd} &= (\text{Pout} * \text{G}) * \text{DutyFactor} / (4 * \text{Pi} * \text{r}^2) \\
 &= (251.19 * 1.33) * 1 / (4 * 3.1416 * 20^2) \\
 &= 0.066(\text{mW/ cm}^2)
 \end{aligned}$$

So the limit is kept.

-----END OF REPORT-----