

# MPE TEST REPORT

**Applicant**      Positioning Universal Inc  
**FCC ID**          2AHRH-FJ2500MG  
**Product**        FJ2500MG 4G LTE Vehicle Telematics Unit  
**Brand**           Positioning Universal.  
**Model**           FJ2500MG  
**Report No.**     R2304A0477-M1  
**Issue Date**     May 23, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

*Wei Fangying*

*Prepared by: Wei Fangying*

*Fan Guangchang*

*Approved by: Fan Guangchang*

**TA Technology (Shanghai) Co., Ltd.**

*Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China*

*TEL: +86-021-50791141/2/3*

*FAX: +86-021-50791141/2/3-8000*

## Table of Contents

1	Test Laboratory.....	3
1.1	Notes of the Test Report .....	3
1.2	Test Facility .....	3
1.3	Testing Location.....	3
1.4	Laboratory Environment.....	3
2	Description of Equipment Under Test .....	4
3	Maximum Output Power (Measured) /Tune up and Antenna Gain .....	5
4	Test Result .....	6
	ANNEX A: The EUT Appearance.....	9

## 1 Test Laboratory

### 1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2 Test Facility

#### FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

### 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.

Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China

City: Shanghai

Post code: 201201

Country: P. R. China

Contact: Fan Guangchang

Telephone: +86-021-50791141/2/3

Fax: +86-021-50791141/2/3-8000

Website: <http://www.ta-shanghai.com>

E-mail: [fanguangchang@ta-shanghai.com](mailto:fanguangchang@ta-shanghai.com)

### 1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 $\Omega$
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

## 2 Description of Equipment Under Test

### Client Information

<b>Applicant</b>	Positioning Universal Inc
<b>Applicant address</b>	4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122, United States
<b>Manufacturer</b>	Positioning Universal Inc
<b>Manufacturer address</b>	4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122, United States

### General Technologies

<b>Model</b>	FJ2500MG
<b>IMEI</b>	356995842113251
<b>Hardware Version</b>	P6.2
<b>Software Version</b>	V0.6
<b>Date of Testing</b>	April 21, 2023 ~ May 5, 2023
<b>Date of Sample Received</b>	April 21, 2023

Note:

1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.
2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

### 3 Maximum Tune up and Antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by  
 Numeric gain (G)=10^(antenna gain/10)

Band		Burst-Averaged output power (adjusted for tune up) (dBm)	Division Factors	Frame-Averaged output power (adjusted for tune up) (dBm)
GSM850	GSM	34.00	-9.03	24.97
GSM1900	GSM	32.00	-9.03	22.97
Note: Division Factors To average the power, the division factor is as follows: 1Txslot = 1 transmit time slot out of 8 time slots => conducted power divided by (8/1) => -9.03 dB				

Band	Maximum Tune up Power		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
GSM850	24.97	314.051	0.00	1.000
GSM1900	22.97	198.153	1.00	1.259
LTE-M Band 2	24.00	251.189	1.00	1.259
LTE-M Band 4	24.00	251.189	1.00	1.259
LTE-M Band 5	24.00	251.189	0.00	1.000
LTE-M Band 12	24.00	251.189	0.00	1.000
LTE-M Band 13	24.00	251.189	0.00	1.000
LTE-M Band 25	24.00	251.189	1.00	1.259
LTE-M Band 26	24.00	251.189	0.00	1.000
LTE-M Band 66	24.00	251.189	1.00	1.259
LTE-M Band 85	24.00	251.189	0.00	1.000
Bluetooth (Low Energy)	-9.62	0.109	2.29	1.694

## 4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following.

TABLE 1 – LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0 .....	614	1.63	*(100)	6
3-30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300 .....	61.4	0.163	1.0	6
300-1500 .....			f/300	6
1500-100,000 .....			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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

Note1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 300~1500 MHz is  $f/1500$ , for 1500~100,000MHz is 1.0. So

Band	The Maximum Permissible Exposure (mW/cm <sup>2</sup> )
GSM850	0.549
GSM1900	1.000
LTE-M Band 2	1.000
LTE-M Band 4	1.000
LTE-M Band 5	0.549
LTE-M Band 12	0.466
LTE-M Band 13	0.518
LTE-M Band 25	1.000
LTE-M Band 26	0.543
LTE-M Band 66	1.000
LTE-M Band 85	1.000
Bluetooth (Low Energy)	1.000

### RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	Maximum Tune up (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	PG (mW)	Result (mW/cm <sup>2</sup> )	Limit Value (mW/cm <sup>2</sup> )	The MPE Ratio
GSM850	24.97	0.00	24.970	314.051	0.062	0.549	<b>0.114</b>
GSM1900	22.97	1.00	23.970	249.459	0.050	1.000	0.050
LTE-M Band 2	24.00	1.00	25.000	316.228	0.063	1.000	0.063
LTE-M Band 4	24.00	1.00	25.000	316.228	0.063	1.000	0.063
LTE-M Band 5	24.00	0.00	24.000	251.189	0.050	0.549	0.091
LTE-M Band 12	24.00	0.00	24.000	251.189	0.050	0.466	0.107
LTE-M Band 13	24.00	0.00	24.000	251.189	0.050	0.518	0.096
LTE-M Band 25	24.00	1.00	25.000	316.228	0.063	1.000	0.063
LTE-M Band 26	24.00	0.00	24.000	251.189	0.050	0.543	0.092
LTE-M Band 66	24.00	1.00	25.000	316.228	0.063	1.000	0.063
LTE-M Band 85	24.00	0.00	24.000	251.189	0.050	1.000	0.050
Bluetooth (Low Energy)	-9.62	2.29	-7.330	0.185	0.000	1.000	<b>0.000</b>
Note: R = 20cm $\pi = 3.1416$ The MPE Ratio = Mac Result ÷ Limit Value							

So the simultaneous transmitting antenna pairs as below:

Σ of MPE Ratios = WWAN Antenna + Bluetooth Antenna = 0.114 + 0.000 = 0.114 < 1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

\*\*\*\*\*END OF REPORT \*\*\*\*\*



## ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.