

MPE TEST REPORT

Applicant Positioning Universal Inc
FCC ID 2AHRH-FT7200MW
Product Vehicle Telematics Gateway
Brand PUI
Model FT7200MW
Report No. R2312A1389-M1
Issue Date February 1, 2024

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.

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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.
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25°C
Relative humidity	Min. = 20%, Max. = 80%
Ground system resistance	< 0.5 Ω
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

Applicant	Positioning Universal Inc
Applicant address	4660 La Jolla Village Drive Suite 1100, San Diego, USA
Manufacturer	Positioning Universal Inc
Manufacturer address	4660 La Jolla Village Drive Suite 1100, San Diego, USA

General Technologies

EUT Description			
Model	FT7200MW		
IMEI	866356068464071		
Hardware Version	P2		
Software Version	BG95M5LAR02A03_01.007.01.007		
Frequency	Band	TX (MHz)	RX (MHz)
	GSM 850	824 ~ 849	869 ~ 894
	GSM 1900	1850 ~ 1910	1930 ~ 1990
	LTE-M Band 2	1850 ~ 1910	1930 ~ 1990
	LTE-M Band 4	1710 ~ 1755	2110 ~ 2155
	LTE-M Band 5	824 ~ 849	869 ~ 894
	LTE-M Band 12	699 ~ 716	729 ~ 746
	LTE-M Band 13	777 ~ 787	746 ~ 756
	LTE-M Band 25	1850 ~ 1915	1930 ~ 1995
	LTE-M Band 26A	814 ~ 824	859 ~ 869
	LTE-M Band 26B	824 ~ 849	869 ~ 894
	LTE-M Band 66	1710 ~ 1780	2110 ~ 2200
	LTE-M Band 85	698 ~ 716	728 ~ 746
	Bluetooth LE	2400 ~ 2483.5	2400 ~ 2483.5
	Wi-Fi 2.4G	2400 ~ 2483.5	2400 ~ 2483.5
Date of Testing	December 29, 2023 ~ January 11, 2024		
Date of Sample Received	December 18, 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

$$\text{Numeric gain (G)} = 10^{(\text{antenna gain}/10)}$$

Band		Burst-Averaged output power (adjusted for tune up) (dBm)	Division Factors	Frame-Averaged output power (adjusted for tune up) (dBm)
GSM850	1 Txslot	34.00	-9.03	24.97
	2 Txslots	33.00	-6.02	26.98
	3 Txslots	31.00	-4.26	26.74
	4 Txslots	30.00	-3.01	26.99
GSM1900	1 Txslot	33.00	-9.03	23.97
	2 Txslots	32.00	-6.02	25.98
	3 Txslots	32.00	-4.26	27.74
	4 Txslots	32.00	-3.01	28.99

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

2Txslots = 2 transmit time slots out of 8 time slots

=> conducted power divided by (8/2) => -6.02 dB

3Txslots = 3 transmit time slots out of 8 time slots

=> conducted power divided by (8/3) => -4.26 dB

4Txslots = 4 transmit time slots out of 8 time slots

=> conducted power divided by (8/4) => -3.01 dB

Band	Maximum Tune up Power		Antenna Gain (dBi)	Numeric Gain
	(dBm)	(mW)		
GSM 850	26.99	500.035	2.00	1.585
GSM 1900	28.99	792.501	2.00	1.585
LTE-M Band 2	25.00	316.228	2.00	1.585
LTE-M Band 4	25.00	316.228	2.00	1.585
LTE-M Band 5	25.00	316.228	2.00	1.585
LTE-M Band 12	25.00	316.228	2.00	1.585
LTE-M Band 13	25.00	316.228	2.00	1.585
LTE-M Band 25	25.00	316.228	2.00	1.585
LTE-M Band 26A	25.00	316.228	2.00	1.585
LTE-M Band 26B	25.00	316.228	2.00	1.585
LTE-M Band 66	25.00	316.228	2.00	1.585
LTE-M Band 85	25.00	316.228	2.00	1.585
Bluetooth LE	8.00	6.310	2.40	1.738
Wi-Fi 2.4G	20.00	100.000	2.03	1.596

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 ²)	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 ²)	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 ²)	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 ²)
GSM 850	0.549
GSM 1900	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 26A	0.543
LTE-M Band 26B	0.543
LTE-M Band 66	1.000
LTE-M Band 85	0.466
Bluetooth LE	1.000
Wi-Fi 2.4G	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/cm²)

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 ²)	Limit Value (mW/cm ²)	The MPE Ratio
GSM 850	26.99	2.00	28.990	792.501	0.158	0.549	0.287
GSM 1900	28.99	2.00	30.990	1256.030	0.250	1.000	0.250
LTE-M Band 2	25.00	2.00	27.000	501.187	0.100	1.000	0.100
LTE-M Band 4	25.00	2.00	27.000	501.187	0.100	1.000	0.100
LTE-M Band 5	25.00	2.00	27.000	501.187	0.100	0.549	0.182
LTE-M Band 12	25.00	2.00	27.000	501.187	0.100	0.466	0.214
LTE-M Band 13	25.00	2.00	27.000	501.187	0.100	0.518	0.192
LTE-M Band 25	25.00	2.00	27.000	501.187	0.100	1.000	0.100
LTE-M Band 26A	25.00	2.00	27.000	501.187	0.100	0.543	0.184
LTE-M Band 26B	25.00	2.00	27.000	501.187	0.100	0.543	0.184
LTE-M Band 66	25.00	2.00	27.000	501.187	0.100	1.000	0.100
LTE-M Band 85	25.00	2.00	27.000	501.187	0.100	0.466	0.214
Bluetooth LE	8.00	2.40	10.400	10.965	0.002	1.000	0.002
Wi-Fi 2.4G	20.00	2.03	22.030	159.588	0.032	1.000	0.032
Note: R = 20cm $\pi = 3.1416$ The MPE Ratio = Mac Result÷Limit Value							

So the simultaneous transmitting antenna pairs as below:

∑ of MPE ratios = WWAN Antenna + WLAN Antenna = 0.287 + 0.032 = 0.319 < 1

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

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

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