



MPE TEST REPORT

Applicant UAB TELTONIKA TELEMATICS
FCC ID 2A3HUFMM13A
Product Fleet Management System
Brand TELTONIKA TELEMATICS
Model FMM13A-Q2IB0
Report No. R2206A0490-M1V1
Issue Date August 9, 2022

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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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	July 19, 2022
Rev.1	Update description.	August 9, 2022

Note: This revised report (Report No. R2206A0490-M1V1) supersedes and replaces the previously issued report (Report No. R2206A0490-M1). Please discard or destroy the previously issued report and dispose of it accordingly.

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, Tangzhen Industry Park, Pudong Shanghai, China
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
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	UAB TELTONIKA TELEMATICS
Applicant address	Saltoniskiu st. 9B-1,Vilnius,Lithuania
Manufacturer	UAB TELTONIKA TELEMATICS
Manufacturer address	Saltoniskiu st. 9B-1,Vilnius,Lithuania
Factory	UAB TELTONIKA EMS
Factory address	Ditvos st. 6, Vilnius,Lithuania

General Technologies

Model	FMM13A-Q2IB0
IMEI	862464066744868
Hardware Version	FMM13A-40
Software Version	FMB.Ver.03.27.13
Date of Testing	June 7, 2022 and July 8, 2022
Date of Sample Received	June 7, 2022

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 Power 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	Maximum Tune up Power		Antenna Gain (dBi)	Numeric gain
	(dBm)	(mW)		
LTE Band 2	22.0	158.489	2.80	1.905
LTE Band 4	22.0	158.489	2.80	1.905
LTE Band 5	22.0	158.489	2.80	1.905
LTE Band 12	22.0	158.489	2.80	1.905
LTE Band 13	22.0	158.489	2.80	1.905
LTE Band 25	22.0	158.489	2.80	1.905
LTE Band 66	22.0	158.489	2.80	1.905
LTE Band 85	22.0	158.489	2.80	1.905
Bluetooth	6.5	4.467	-1.43	0.719
Bluetooth (Low Energy)	-2.5	0.562	-1.43	0.719

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)
LTE Band 2	1.000
LTE Band 4	1.000
LTE Band 5	0.549
LTE Band 12	0.466
LTE Band 13	0.518
LTE Band 25	1.000
LTE Band 66	1.000
LTE Band 85	0.465
Bluetooth	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	Antenna Gain (dBi)	Maximum tune up (dBm)	Maximum EIRP (dBm)	PG (mW)	Test Result (mW/cm ²)	Limit Value (mW/cm ²)	The MPE ratio
LTE Band 2	2.80	22.0	24.800	301.995	0.060	1.000	0.060
LTE Band 4	2.80	22.0	24.800	301.995	0.060	1.000	0.060
LTE Band 5	2.80	22.0	24.800	301.995	0.060	0.549	0.109
LTE Band 12	2.80	22.0	24.800	301.995	0.060	0.466	0.129
LTE Band 13	2.80	22.0	24.800	301.995	0.060	0.518	0.116
LTE Band 25	2.80	22.0	24.800	301.995	0.060	1.000	0.060
LTE Band 66	2.80	22.0	24.800	301.995	0.060	1.000	0.060
LTE Band 85	2.80	22.0	24.800	301.995	0.060	0.465	0.129
Bluetooth	-1.43	6.5	5.070	3.214	0.001	1.000	0.001
Bluetooth LE	-1.43	-2.5	-3.930	0.405	0.000	1.000	0.000
Note: R = 20cm $\pi = 3.1416$ The MPE ratio = Mac Test Result ÷ Limit Value							

So the simultaneous transmitting antenna pairs as below:

$$\sum \text{of MPE ratios} = \text{WWAN Antenna} + \text{Bluetooth} = 0.129 + 0.001 = 0.130 < 1$$

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.